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RAPPORT OF MY VISIT TO BEIJING AND SHANGHAI PEOPLE'S REPUBLIC OF CHINA (Sept. 1985)

Preparation of the Visit

According to the Job Description and on base of the discussions and results of my visit in spring 1984, I have prepared previously to the visit:

- A bibliographic research concerning the item 1 of the Job Description (fabrics coating and the relative coating resins, auxiliaries and dyes or organic pigments).
- A study of the most representative and important publications in this field and preparation of the here attached resumes for my lecture and discussions in Shanghai.
- Using the patent cards of the dyes produced in China - recieved during my last visit - I have defined the specifical technical properties of each product as well as the fields of application and application methods best suitable for each product.
- From this study I worked out the technical profile of each product in order to get a basis for promotional actions - not only for domestic sales but also for export of Chinese dyes based on there technical propierties. what has been finally one of the main aspects of the discussions in China.
- Due to the fact that in the dyeing processes will never be employed single dyes. I tried to find out which would be the best so called "trichromies" with the best chances to perform on bulk basis using either only chinese dyes or combining these with foreign products.
- Although in the discussions during my last visit and according to the Job Description, our partners in China have been especially interested in the disperse and reactive dyes. I also worked out a similar concept concerning acid and pre-metalized dyes for wool and polyamide and specially for silk as well as for vat dyes for cooton, viscose and silk. all these kind of dyes been produced in China.
- A review of the newest technologies, specially based on developments since my last visit concerning points 2 and 3 of the Job Description has been necessary in order to keep our part-

ners informed about technologies which have already been already introduced in China by suppliers of dyes and chemicals, of textile dyeing machinery, of laboratory equipment and of electronic control systems. That has been very usefull because our partners attached to the Chemistry Ministery don't always recieve the best information and specially the latest informations about new technologies employed by the textile dyehouses.

- In this preparation I tried again to find for each item a compromise about scientific acknowledges and practical market oriented technical informations which allow to put priorities concerning the importance of each test method which can be em- Due to the general lack of knowledge on mathematic statistics which normally have those people with chemistry background (and in this aspect China is not different from other countries) I also prepared a documentation allowing me to give instructions on mathematic statistics, which I added to the program.

Visit

The first day of my activities in Beijing, after the visit to the UNDP, I had an interesting meeting with the representatives of the management of the Textile Academy of the Ministry Of Textile Industry and with the representatives of the management of Foreign Affairs Department of the Ministry of Chemical Industry.

The Textile Academy of the Ministry of the Textile Industry has been very interested in the technologies which can be employed in some equipment the Textile Industry has already received in China and I tried to give an overview about the new trends, especially concerning the use of dyes produced in China. Regarding the different fibers, I payed special attention to the blends polyester/cotton and polyester/viscose using continuous dyeing methods and batchwise dyeing methods, pointing out the necessity to improve the flexibility of the production. The market requirements ,especially in China, where fashion plays just now a very important role, moves very quick from standard production of big lots to a large variety of styles, colours, designes etc., that means that in the future more and more will be dyed small lots. The biggest problem in the future will be to keep the dyehouses very flexible in the production without losing productibility.

Due to the fact that the market requirements ask more and more for a very precise reproduction of colours, a lot of corrections are to be made with the corresponding loss of productibility and an increase of the production cost. One of the main goals what has to be worked out together with the Chemical Industry is to find the way to choose the products which allow high reproducibility of shades and, consequently, avoid corrections of batches. I will send to our partners of the Textile Academy a list of interesting publications (allready done) and they will ask me then for copies of the most representative papers.

For my discussions with the management and representatives of the Foreign Affairs Department of the Ministry of the Chemical Industry the copies - provided by Mr. Sissingh - concerning the Project Document from November 1984 as well as the Progress Rapport from June 1985 prepared by the Shanghai Dyestuffs Research Institute have been very useful. It was a pity that I did not have this documentation earlier because it was very useful to have a look at the goals I had to support during my visit in China. Consequently, I had to study in the depth these documents in the same evening in Beijing before I started my visit to Shanghai.

In the future it would be more convenient to equip the experts on such missions not only with the Job Description but also with more documentation about overview of the complete project and importance of their specific job in order to fit better the final goals of such missions. For the first time I got a more detailed information about the realised and the planned adquisitions made by the Shanghai Dyestuffs Research Institute concerning laboratory equipments and especially concerning the pilot plant. That is very important in order to recommend the best use of the on hand equipments and not let people dream of other equipments which can be discussed together as a future project, but doesn't help to resolve the immediate problems.

In the internal discussions in the Shanghai Dyestuff Research Institute we have dealed following points:

- dyeing of cotton and viscose with direct dyes: very interesting laboratory work was presented to me concerning dye behaviour of Chinese dyes against foreign dyes, especially a very well introduced Japanese trichromie. Evaluation of the dyeing properties of this kind of dyes: compatibility, migration rate, exhaustion rate, optimation of the needed quantity of salt for the best yield depending on the dye as well as on the dye concentration used in dyeing, criterion to choose the best dyestuffs allowing a ton-in-ton of the blends cotton/viscose, fastnesses, limits of depths in order to fulfill the requirements of the market concerning fastnesses for each principal kind of endproduct.
  During my stay laboratory trials were made according to my instructions in order to illustrate the mentioned properties and in order to allow a better placement of the Chinese dyestuffs against foreign competition. Basis to establish useful promotional material and highlines to conduct bulk trials in the dyehouses of their customers.
- reactive dyestuffs on cotton and viscose: taking in account the differences between these kind of dyestuffs and the direct dyes the same points have been dealed as mentioned above for the direct dyes. At present the classification of these dyestuffs is made according to the chemical constitution but I recommend to retouch this classification according to the application properties. That will allow to reduce the five different groups of reactive dyestuff produced in China to only three groups with well defined application fields.So it will be easier to introduce these dyestuffs into the market and will simplify the

understanding how to use these dyestuffs by the textile industry.
For these dyestuffs and according to each class of dye, optimal quantities of salt as well as of alcali have to be estimated in the laboratory trials giving complete information in order to guarantee the best results concerning reproducibility and yield. We worked out a mathematical model which allows to test the accuracity of the laboratory trials and the preparation of tables to be proposed to the customers. Special comments have been made concerning the market segment the best apprpopriate for the promotion for each kind of reactiv dyestuffs.

- Disperse dyes for PES-fibers: special attention has been payed to the stability of the dispersion, the main differences between the powder and liquid brands, the application field of these two physical forms, the factors which influence the dispersion stability and the test methods to check it in order to improve the quality of boths: products and dyed textile materials. Explain the best tests for quality control of production of powders and liquids, for developement of dyes with better stability and dispersibility, for testing the dispersing agents and drying conditions, chemical and physical action of the dispersing agents - specially lignine sulfonates - on the dyes.
- For all the methods used to test dyestuffs I have pointed out the necessity to establish three blocks of test methods, according to the goals respectively areas in which the methods have to be applied:
a) test for quality control of production: simples and needing short testing times. A complete coordination has to be achieved between the tests for production in the production plans (dye makers) and the tests used in the Institute for quality control of some special dyes, including the lots for export.
b) for the development of new products: in order to establish which kind of tests have to be used I pointed out the importance of listing of properties according to the scope of the products respectively of the dyestuffs to be developped. It is very useful to establish priorities and eventually to weigh out the importance of each property. In the following step has to be defined which are the best tests to assess the corresponding property, checking according to these tests the mark leaders resp. the products now used in the dye houses. Afterwards it will be easier to accomplish a screening of the products developped by the organic department of the Institute. The whole work is additionally a very good basis to prepare the promotion material for the introduction of the chosen products on the market, trying to design a product profile.
c) More sophisticated tests, which normally needs more time, has to be reserved to clarify behaviours, to explain relationship and support the results related to b), if the application test methods are not able to get enough transparency concerning differenciation of products.
I have used several examples of works still running in the Institute to show in which cases the so called application tests or the scientifical tests have to be employed.

- Dyeing of polieste/cellulosic blends: based on the discussions concernig each sinole fiber (see above) special comments have been added concernino the interaction between dyestuffs for each fiber of a blend. the way to check this interaction and the technologies employed in order to minimize the negative effects of these interactions. Special attention has been paved to new technologies allowing the dosino of chemicals to the dyeing system and to the description of new peripherics and electronic controls already in use in some mills in China. with additional comments about the requirements on dyes and chemicals for take better profit of such technologies.
- New japanese reactive dyestuffs for cellulosic fibres with an acid fixation (without alcali): these relatively new dyes have been chemically reproduced in the Institute. The convenience to spend only a limited time studying this kind of dyestuff taking in account limitations in the practical application of the dyes has been discussed in the very depht. The suppliers of this dyestuffs have introduced these products in the chinese market claiming there easy application method. According to my estimation. the impact of this dyestuff has been even bigger in China as in other countries. There chemical structure is expensiv.
  I have tried to fill the gape of information concerning the real importance of this dyestuff in the world market. discribing exactly the properties of this dyestuff in comparation with the normal reactive dyes. Nowadays. it is still too early to ellaborate a complete judgement about the value of this new development of Japan. A lot of other important fields can be more attractive and more efficient for China as the study of this brand new kind of dyestuff which presents in spite of the apparent advantages also disadvantages - reproducibility. possibility to control there strike. chlorine fasteness - which have to be assessed very well before spending too much time in this field. That is a tipical example from cases which are very interesting from scientifical point of view but it is not sure that they can apport a big support to the goal of the project between the UNTP and China:
  > "to strenght research and development capabilities of China in dyestuffs and organic pigments and their application technology. in order to substitute gradually imported products and outside services through local products and local capabilities"

  An evaluation of the potential profit of the development work has to be also a basis in order to establish priorities.
- Dyeing of cotton and viscose with vat dyes: these dyestuffs are getting more and more importance and an increasing interest in these dyes has to be expected. specially due to the fastness properties (important fact for export). We discussed the basic technologies for applying these dyestuffs and I recommended to the Institute to get more experience in the laboratory as well as in the bulk production. The finishing of these dyestuffs - more o less similar to the finishing of disperse dyes - has to be well studied taking in account the two main fields of application: continuous and exhaustion dye systems.
- Dyeing of wool and PES/wool blends: this field has been partially neclected by the Institute. although dyestuffs for wool

are produced in China. The properties of the acid leveling, acid milling, premetalized and reactive dyes for wool have been discussed in detail, presenting and describing the behaviours and properties to be tested. Dyeing processes and dyeing equipments have also been presented and discussed, paying additionally attention to the special behaviour of the disperse dyes in this application field. Specific testmethods as well as specific profiles of disperse dyestuffs for the blends polyester/wool have been explained and defined.

- Dyeing of silk: due to the fact that for this fiber will be employed a similar range of dyestuff as for wool and going out from the importance of this fiber in China, specific comments concerning again the profiles of the dyestuffs for this fiber and the test methods to describe the behaviour of the best appropriate dyes have been presented.
- Auxiliaries and chemicals for dyeing: for this field and according to the Development Project of November 1984, this item has to be dealed by another expert. Nevertheles, it has been very convenient and necessary to take into consideration the auxiliaries in dyeing processes in the discussions and presentations concerning the items mentioned before. Examples related to development of new products, in the above mentioned way, have been also explained in the case of dyeing auxiliaries. The reasons the behaviour of dyestuffs can be improved or even decreased according to the auxiliaries used in each commented dyeing process, has been discussed and presented with some additional comments concerning chemical constitution of this products.
- Pilot plant: big progresses have been made after my last visit concerning equipment in the pilot plant. In the field of yarn dyeing I have made some recommendations in order to improve the possibility to test dyestuffs as well as to pepare demonstrations for the textile industry and/or the study of problems arising in the bulk production. We established together a catalogue of performances which have to be required from a yarn dyeing machine allowing the use of these equipments for tests as well as for small production (e.g. whole spindle with several packages, which behaviour is completely different as the dyeing only one package).
  Other comments have been made concerning ancilliary or peripheric equipment for dyeing machines in general allowing a better control of the dyeing levelness and a better reproducibility as the dosing of chemicals, in order to obtain a better reproducibility of results. These units are already in use in some Chinese dyehouses, unfortunately far away from Shanghai. For this reason the people of the Institute have no opportunity to get a better overview about possibilities to improve the performances of Chinese dyestuff or for trials in view to get better details about the properties which should be required from the dyestuffs.
- Lectures for the co-workers of the Institute as well as for people invited from textile mills and dyemakers: during four days I had the opportunity to make presentations in the morning on the following items:
  a) the dyeing of polyester/cotton and polyester/viscose blends

b) properties required from the dyestuffs and criteria to choose dyestuffs for the different technologies, with special emphasis to the disperse and reactive dyes
c) Fabric coating and the relative coating resins, auxiliaries and dyestuffs, respectively organic pigments.
d) the mathematic statistic, basis for improvement of the efficiency of the development, of effectiveness of production of dyes and chemicals, and of textile dyeing and finishing: normal distribution, definition of mean value and standard deviation, significance of difference between means and between mean of trials and a fixed value, standard deviation of mean and limits of confidence of mean values, including determination of the minimal number of trials for a given range of confidence, analyses of variance, analyses of regressions, with main emphasize on the linear regression.

- Round table discussions with the participants to these presentations, dealing specific theoretical and practical problems and questions presented by the assistants.
- Fellowships for co-workers of the Institute: a general discussion concerning fields and places in which would be more interesting to get an additional instruction and experience for some delegates of the Institute abroad.

Final recomendations

As main points of special interest in the next future I'd like to mention following items:
- a manual of basic test methods to be used in the Institute as well as in the laboratories of the dyemakers for quality control and in the textile plants for control of bought products and dyestuffs has to be worked out. This manual has to contain a description how to carry out the methods for quality control as well as the equipement. At the same time, each information which will be result from the application of these tests in the different places mentioned before, should be a basis to improve the quality of the products, allowing a better understanding of the claims of the users. Finally that should allow to make progresses in comprehension of the improvements of the quality of already produced dyestuffs and chemicals as well as allow to develop new products which can be easily promoted in the domestic market.
- put more emphasis in the study of vat dyes as well as in dyeing knowledges on processes for wool, wool blends and silk. Special attention has to be paved to the behaviour of disperse dyes on PES-wool blends.
- all the reactive dyestuffs produced nowadays in China and till now classified in five groups should be classified in three groups, making easier the substitution of imported dyestuffs through chinese dyestuffs.
- the new computer adquired by the Institute should be used also to take more advantage of the application of the mathematic statistic in the planning and evaluation of single projects

concerning development of dyestuffs and auxiliaries as well as of their application methods resp. of assessment of their properties.
- the adquisition of adequate equipment for yarn dyeing will be a good complementation of the already existing equipment in the pilot plant, including the possibility to be employed also as testmethod for dispers and vat dyes (dispersion stability).

I have offered to the Institute the possibility to contact me in order to help by the assessment of trials or by the planning of research and development projects, items which cannot be taught on theoretical basis but related to precise cases.

J. Carbonell

ESTADO ACTUAL DE LA TECNOLOGIA Y APLICACIONES DEL RECUBRIMIENTO DE TEJIDOS A RASQUETA

Introducción

Las técnicas de recubrimiento de tejidos actualmente empleadas son las siguientes:

Recubrimiento directo (a rasqueta)
" por transferencia
" mediante calandrado por fusión
por coagulación

El sistema de recubrimiento directo es el más sencillo y cubre una gran gama de artículos. Ver ultima página
Una instalación de este tipo consta de un desenrollador de tejido de tensión compensada, un cabezal, que suele ser mixto, de aplicación de pastas mediante rasqueta, un tunel de secado con eventual rame (según los artículos a revestir), unos cilindros re refrigeración y un sistema de enrollado igualmente de tensión compensada.

El sistema de recubrimiento por transferencia está basado en la producción de un film contínuo de resina sobre una banda antiadherente el cual mediante un adhesivo, se adhiere posteriormente al tejido.
Una instalación de este tipo consta de dos unidades de aplicación en tandem, análogas a las utilizadas en el recubrimiento directo, pero con doble unidad de enrollado de materiales, una para el papel y otra para el tejido, con la adición de una calandra o unidad de doblado que efctua la unión del textil al film previamente obtenido en la primera unidad, mediante el adhesivo aplicado en la segunda. ⊗ Epoxy resins Melaminics
La gama de artículos producidos abarca cuatro sectores principales: marroquinería, calzado, confección y tapicería, utilizando como resinas el cloruro de polivinilo y los poliuretanos, así como ésteres del ácido acrílico y algunos copolímeros de butadieno en forma de dispersión, como adhesivos, en determinados artículos.

Multy layer Laid-in process

Melting Calandar

El calandrado por fusión consiste en fundir un polímero termo plástico, como el poliuretano, en una calandra calentada con un fluido térmico, entrando en contacto con el tejido que lo acepta, finalizando con un calandrado para definir la superficie del artículo una vez recubierto. ⊗ Vinyl plastics - Thermo fusibles
Se utiliza en una gama reducida de artículos técnicos e industriales, por no aportar una gran belleza de aspecto, aunque sí grandes resistencias físicas. — Upholstery / Automotive

Extruder Sheet forming die

Coagulation

El sistema de coagulación, basado en crear una rápida falta de solubilidad del poliuretano por descomposición de la mezcla solvente mediante agua, con lo que el polímero coagula rápidamente de una forma desordenada que provoca su estructura microporosa, consta de dos

⊗ Polymerization: chemically / physically
catalist / heat / electron beam
Ultraviolet radiation

unidades de aplicación de pastas directamente sobre el tejido, entre las cuales hay unos baños de precoagulación: la primera capa actua de anclaje y la segunda es de acabado final; el material recubierto entra luego en el baño de coagulación propiamente dicho y en los de lavado, secándose posteriormente en una rame tensora.

Los artículos que se obtienen van destinados a los mismos sectores que los realizados por transferencia, siendo de mejor aspecto e, indiscutiblemente, de unas resistencias extremas, con la ventaja de obtener una estructura completamente porosa. La necesaria recuperación del disolvente empleado en la disollución de los poliuretanos, es el motivo de que existan pocas instalaciones de este tipo.

1. Instalaciones de recubrimiento directo

Uno de los puntos clave de la instalación es la garantia de una tensión constante, variable según los artículos a recubrir; en la mayoría de las instalaciones se acoplan, entre la unidad de desenrollado y el cabezal aplicador de pasta, un enderezador de trama y un acumulador de tejido para facilitar la continuidad en el cambio de plegadores de tejido.

A la salida del tunel de secado, y después de los cilindros refrigeradores, es frecuente instalar un acumulador de tejido y una calandra de cilindro metálico/cilindro de papel, previo al enrollado; en algunos casos se prefiere que esta unidad esté separada, por considerar que un reposo del material, con la consecuente absorción de humedad, beneficia al calandrado final, caso de que el artículo lo requiera.

Es también común la instalación de dos unidades de recubrimiento en tandem, para los artículos que precisan una doble aplicación de resina; una que puede considerarse de anclaje y una final que define el efecto superficial deseado.

Como aspectos específicos de la instalación, cabe destacar el cabezal de aplicación y los túneles de secado y reticulación.

1.1 Cabezal aplicador

Existen, básicamente, cuatro sistemas de aplicación: rasqueta al aire, donde el tejido es mantenido en posición por dos cilindros, cuya distancia entre ellos es variable; rasqueta sobre banda de goma rasqueta sobre cilindro y rasqueta sobre mesa, menos utilizada.

Floating Knife

El sistema de rasqueta al aire, entre cilindros, se emplea cuando se desea depositar una mínima cantidad de pasta y una poca penetración en el tejido.

Se utiliza para el recubrimiento, en general, de poliamida para artículos depertivos o lonas destinadas a marquesinas, si bien en este caso se dispone, a veces, entre cilindros, de dos rasquetas consecutivas y con pasta cada una para garantizar una total cobertura que asegure una máxima resistencia a la columna de agua.

Los tipos de rasqueta más comunmente empleados son: la plana, de 1 mm de ancho y la de "zapatero" de 2mm para la plicación rasqueta al aire y rasqueta sobre banda de goma; las de "zapatero" de 2 y 4 mm son empleadas en el sistema de rasqueta sobre cilindro.

En el sistema de rasqueta sobre banda de goma, ésta suele ser de una dureza de 60 a 65 ºShore A, utilizándose cuando han de recubrirse tejidos que contienen un cierto pelo que interesa eliminar, y cuando la cantidad de pasta a depositar, superior a la de la rasqueta al aire interesa que penetre en el interior del tejido.

El sistema de rasqueta sobre cilindro se emplea cuando hay que hacer penetrar la pasta de recubrimiento en el interior del tejido y éste es ya de cierto grosor. y cuando se desea que la resina cubra total-mente y de forma uniforme al mismo. El cilindro es de goma de unos 85º Shore A. En algunos artículos, como el recubrimiento del dorso de alfombras, se utiliza un cilindro de 20-25 cm de diámetro, en sustitución de la clásica rasqueta, lo que facilita la continuidad del proceso al no tener que procederse a la limpieza de la rasqueta cuando se emplean compounds de latex que tienden a gelificarse en los bordes de la misma.

1.2 Túnel de secado

Los túneles que funcionan por el método de flujo a contra-corriente con rendimiento bajo, son cada vez menos empleados.

Los túneles de impulsión vertical y los de toberas son los más utilizados por su versatilidad modular.

Para determinados sistemas de recubrimiento, como es por ejemplo el del PVC espumado, es importante que la temperatura se mantenga dentro de límites muy estrechos, del orden de ± 1ºC, para lo cual, las baterías calefactoras no han de tener inercia térmica y ser de rápida respuesta.

2. Productos utilizados

En la tabla se indican las principales resinas empleadas en el recubrimiento directo.

Forma de la resina	Tipo de resina	Principales aplicaciones
En solución	Poliuretanos alifáticos monocompuestos reactivos	Cortinas, confección (poliamida)
	Poliuretanos alifáticos monocomponentes	Cortinas, confección
	Poliuretanos aromáticos bicomponentes	Artículos técnicos (poliamidas)
	Esteres del ácido acrílico	Cortinas (poliamidas)
	Elastómeros de siliconas	Artículos técnicos
	Caucho natural o sintético	Artículos industriales
	Caucho clorado	
	Neopreno	

En dispersión	Poliuretanos alifáticos monocomponentes	Lonas y lonetas de fibra sintética. Artículos confección. Telas encuadernación. Tapicería. Container plegables.
	Esteres del ácido acrílico	Lonas y lonetas de algodón Cortinas baño. Confección. Tapicería
	Butadieno-estireno	Alfombras. Tapicería
	Butadieno-estireno-acrilonitrilo	Alfombras. Tapicería. Artículos industriales.
	Butadieno-acrilonitrilo	Alfombras, tapicería. Sábanas impermeabilizadas para hospitales.
Plastisoles	PVC	Lonas. Cortinas opalescente Telas encuadernación. Artículos marroquinería.

Como aditivos que se pueden incorporar a las resinas, pueden considerarse los modificadores del tacto (siliconas, acetobutiratos de celulosa, etc.), bactericidas, mejoradores de la adherencia entre sustrato y resina, etc.

Por orden de importancia los copolímeros de butadieno ocupan el primer lugar en cuanto a consumo, debido al tipo de artículos a que van destinados (alfombras), seguidos del PVC y los ésteres del ácido acrílico, tanto en solución como en dispersión.

2.1 Poliuretanos

Los poliuretanos utilizados en recubrimientos se presentan en tres formas:

- En dispersiones acuosas (III)
- En disolución
  - Sistemas de un componente (I)
    - Reactivo
      - Termoplástico
      - Aromático
      - Alifático
  - Sistemas de dos componentes (II)
- Sistemas reactivos exentos de disolventes

(II) Los sistemas en disolución se ofrecen en forma de: soluciones de dos componentes, principalmente en éster acético; disoluciones aromáticas de un componente en dimetilformamida/metiletilcetona o disoluciones alifáticas de un componente exentas de DMF (p.e. en isopropanol/toluol/etilglicol).

Los sistemas de dos componentes reaccionan después de la adición de un reticulante y un catalizador de la reacción, formando la película.

(I) Los sistemas de un sólo componente no requieren una reticulación química para la formación del film, existinedo en el mercado poliure-

tanos solubles en "soft solvents" exentos de dimetilformamida, tales como cetonas y alcoholes.

Las dispersiones de poliuretano son poliuretanos lineales de un sólo componente, los cuales contienen adicionalmente grupos de efecto hidrófilo; la formación de la película tiene lugar por simple evaporación de agua, no precisando reticulación química.

2.2 P.V.C.

Se utiliza en forma de emulsión o de suspensión.

Para la obtención de pastas aplicables con rasqueta sólo se utiliza el PVC en emulsión.

Se aplica conjuntamente con plastificantes (para acrecentar su flexibilidad y fluidez), estabilizantes, cargas y pigmentos.

Como plastificantes se usan los ésteres de ácidos orgánicos (ftálico), ésteres del ácido fosfórico, poliésteres de ácidos dicarboxílicos y de glicerina.

Como estabilizantes se usan el carbonato sódico. sales de calcio, cadmio, etc.

Su adhesión sobre las fibras sintéticas es mucho menor que sobre el algodón; en general, sobre tales fibras, los polímeros en solución de solventes tienen mayor adherencia que las emulsiones.

En la aplicación sobre fibras sintéticas, en la capa base se añade un adherente.

2.3 Polímeros y copolímeros acrílicos

Se presentan en forma de dispersión(emulsión) o de solución en disolventes orgánicos.

En general, acompañan a la emulsión: un espesante (CMC) para adecuar la viscosidad, materiales de carga o relleno (carbonato cálcico), resinas U-F o M-F que aumentan la solidez en medio acuoso, pigmentos orgánicos o inorgánicos, matentes, etc.

Un recubrimiento clásico para acabado hidrófobo en tejidos de poliamida consiste en aplicar una capa básica seguida de un secado a 80ºC y a continuación una capa cubriente, con una carga total, entre ambas, de hasta 20 g/m^2; finalmente se condensa a 150ºC durante 4 minutos.

En un proceso de recubrimiento con dispersiones se aplican sucesivamente dos capas, con secados intermedios de 100ºC, pudiéndose proceder luego a un hidrofugado, que se aplica por fulardado y a una posterior condensación.

3. Aplicaciones

En la tabla se indican ejemplos de las principales aplicaciones actuales de los tejidos recubiertos por rasqueta.

Recubrimiento tipos poliamida	Prendas de lluvia
	Telas paragüas umbrellas
	Artículos deportivos: Anoracks; Mochilas Sporting bags; Tiendas de campaña tents
Recubrimiento de tejidos de fibra sintética o sus mezclas con algodón para cortinas	Baño
	Enrollables
	Opalescentes Tipo foscurit)
Recubrimiento de tejidos convencionales para confección	Gabardinas
	Cazadoras
	outdoor furnitures
Recubrimiento de lonas y lonetas	Obtención de efectos especiales (listados) field covers / construction covers
	Tipos de elevada resistencia a la columna de agua
	Para marroquinería ~~furniture~~ lady' bags - luggages
blanket Tarpolia	Toldos para camiones ~~lona especiales~~ truck covers boat tops or covers
Tarpaulin	
Recubrimiento de artículos para uso industrial	Cintas transportadoras Endless blanket or bc coated abrasives
	Containers plegables inflated structures
	Sábanas para hospitales
Recubrimiento de artículos para tapicería. furniture (*)	Para dar estabilidad dimensional pero con elasticidad
	Para fijar los bucles o penachos
Recubrimiento de alfombra	Para dar un efecto antideslizante
	Para fijar los bucles o penachos
	Wall covering
Recubrimiento de telas para encuadernación.	

(*) automotive interiors: head liner
seat covering
dash board panels
door insets

auto headtop coverings
convertible tops

Continued from page 50

Laminating is another method for forming composite structures similar or identical to those produced by coating. In lamination, two or more materials are joined together to form a multi-layered composite. The joining may be accomplished by the use of an adhesive material to hold the layers together, or it may be done by heating one or more of the layers to the softening point and then applying pressure to effect the bond. In another form of lamination, a thermoplastic material such as vinyl or polyethylene is heated to the melting point in an extruder, forced through a sheet forming die, and laid onto the substrate where it is pressed in with the use of a pair of pressure rollers, one of which is chilled.

The distinction between coating and laminating operations is not as clear as might be expected at first glance. There are many instances where essentially the same product may be made by direct coating onto the substrate, or by preforming a sheet of the coating material and laying the substrate into the partially solidified coating. The choice of method used would mainly depend on the nature of the substrate: a dense, woven fabric could be coated satisfactorily by either method, but a loose, knitted fabric would be coated more satisfactorily using the laid-in approach. Of course, formation of a composite structure using metal foil or plastic film or paper, in combination with a textile substrate, will require the use of laminating techniques, while the application of an acrylic latex to a fabric will require one of the direct coating methods.

Some of the major applications of coated textiles for industrial and related uses are: automotive interiors (headliner, seat coverings, dashboard panels and door inserts); auto hardtop coverings and convertible tops; boat tops and covers; tents and inflated structures; luggage and accessories; awnings, umbrellas and outdoor furniture; tarpaulins, field covers, truck covers and construction covers; coated abrasives; sporting bags, and protective apparel. The largest single application of coated fabric is wallcoverings. The largest markets for rubber coated fabrics (other than tires) are diaphragms and packing materials, pond and pit liners and (recently) roofing membranes.

Coating and Laminating Methods

Calendering

Calendering is a method in which a coating material in a molten state may be applied. It should be distinguished from "Schreiner" calendering in which fabric is passed between high pressure heated rolls for the purpose of embossing or flattening the fabric.

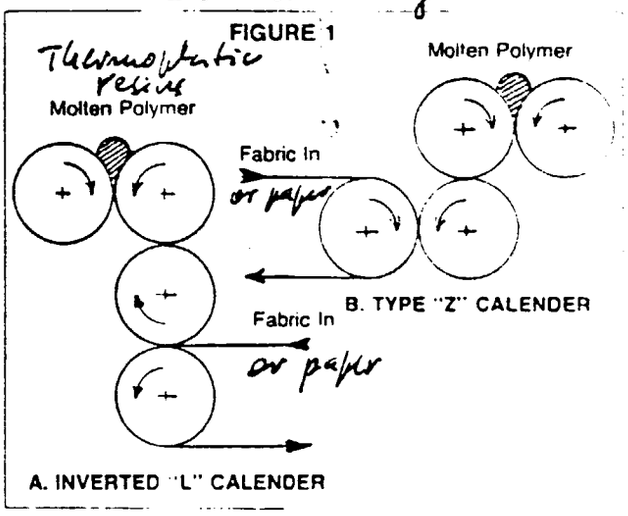
Calender coating (Figure 1) is used to apply vinyl plastics or thermoplastic rubber to a fabric substrate. In this operation, the coating material is heated in the vee formed by two rollers set a specified distance apart, so that a thin, reproducible film of the thermoplastic material can be transferred to a fabric that wraps between a second pair of rollers adjacent to the first pair. The four rollers may be arranged in an L-shaped (1A) or Z-shaped (1B) configuration. This operation can be used to apply moderate to heavy coatings of thermoplastic resins to a substrate.

If a release paper is used in place of the textile substrate, films can be formed that may later be used to laminate to a fabric.

Calendering has been the preferred method for coating

Calander coating

FIGURE 1



textiles for the automotive industry and for much of the vinyl-coated furniture upholstery trade.

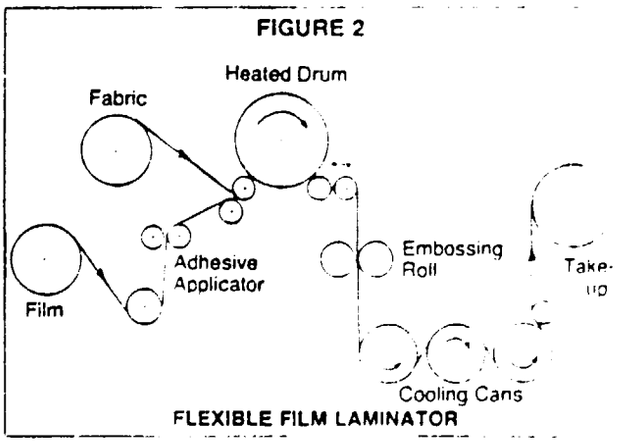
Laminating

Flexible film laminating is often used when a specific surface texture is desired on the finished product. The film is preformed, either by calendering as described earlier, or by extrusion. Thin films are formed by extrusion and blowing (Figure 2).

The film may be coated with an adhesive, or merely heated to the softening point, and brought together with the substrate fabric under sufficient pressure to provide intimate contact. At this point, an embossing surface may be used on the film side to impart the desired surface pattern.

The laminate is then cooled to solidify the plastic film and lock in its surface pattern.

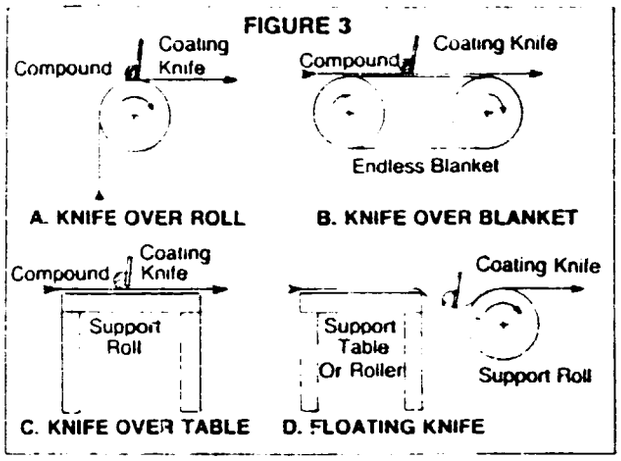
FIGURE 2



FLEXIBLE FILM LAMINATOR

Direct Coating

Several methods of direct coating are used in the industry (Figure 3). The simplest of these are knife-over-roll (3A), knife-over-blanket (3B), and knife-over-table (3C). In each case, the coating material is applied directly to the moving substrate at a point above a supporting surface (roller, blanket or table), and a blade is used to meter a reproducible thickness of the coating onto the substrate. A similar method is called the floating knife (3D). Here, the coating material is also applied directly to the fabric, but at a point where there is no support. The metering blade scrapes off any of the coating compound that has not penetrated into the sub-

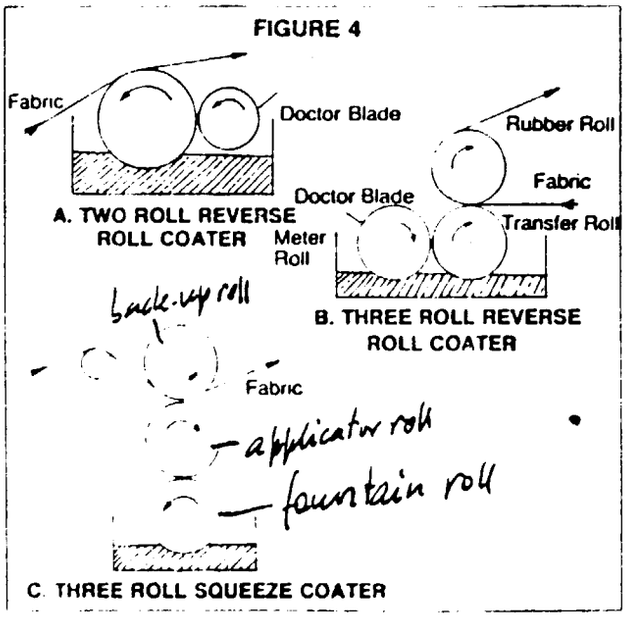


strate, unless a special blade is used that has grooves permitting a small amount of the compound to pass under.

Somewhat more complex methods of coating application include the reverse roll systems (Figure 4). In these operations, the coating material is picked up from a supply bath by one roller, and any excess material is removed by a metering roll - rotating in the opposite direction, placed a specific distance from the first.

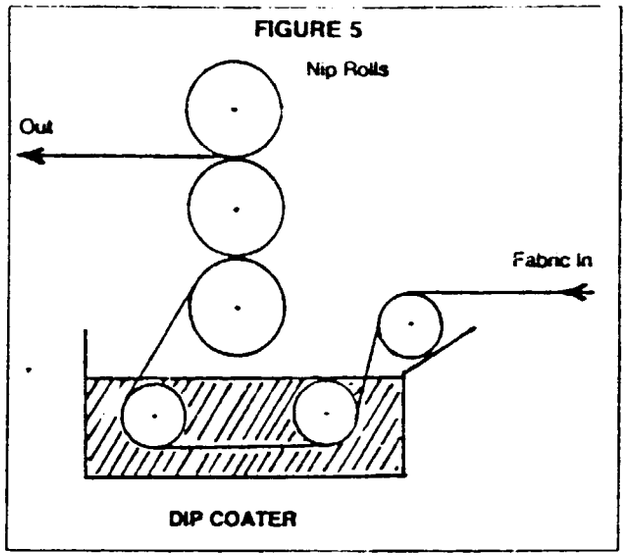
This action leaves a thin film of coating material on the first roller, which then transfers the material to the fabric. With a two roll coater (4A), the fabric is held in contact with the applicator roll by web tension, while with a three roll coater (4B), the fabric is pressed against the transfer roll by a rubber back-up roll.

Another direct coating method is the three roll squeeze coater (4C) which applies low viscosity coating materials. The coating material is transferred from the bath to the applicator roll by a pick-up or "fountain" roll. The material is forced into the fabric by the pressure of the applicator and back-up rolls.



Impregnation and Dip Coating

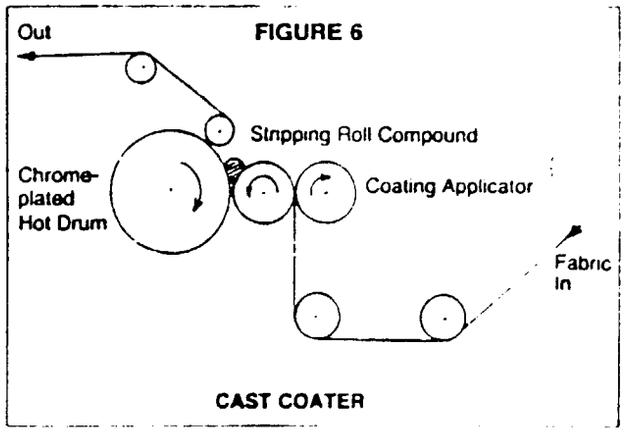
This technique (Figure 5) is commonly used in the textile industry for the application of finishes. It is used when it is desirable to fully saturate a substrate. The fabric passes directly through a bath of the coating material or finish, picking up more material than desired in the process. The excess material is then removed, usually by pressure through a pair of nip rolls. Some saturation coaters provide the capabilities of multiple passes through the bath combined with multiple nips, or of reverse roll metering of the coating material.



Other Coating Methods

Several methods of coating are available that do not fall neatly into the preceding categories. These include cast coating, extrusion coating, curtain coating and spray coating.

Cast coating is used to produce very smooth coated surfaces, and is capable of coating fairly open fabrics or those with considerable stretch (Figure 6). The coating material is applied just as the substrate comes into contact with a heated drum, and during contact with the drum the coating is cured. The exact nature of the coating surface is determined by the surface of the drum, as well as the type and amount of coating and the characteristics of the substrate.



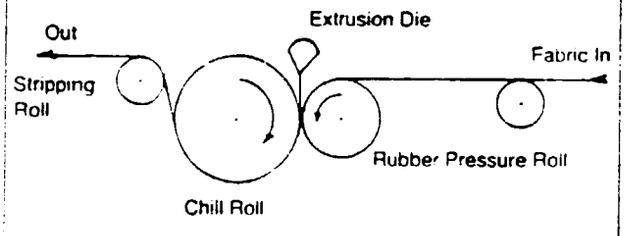
Extrusion coating (Figure 7) can be used for the application of thermoplastic materials such as vinyl and polyethylene. The plastic is forced through an extruder which

Continued on page 54

Continued from page 53

melts it, and then is forced through a die that forms it into a semi-solid sheet. The sheet contacts the substrate just before it passes through a nip formed by a chill roll and a back-up roll. The chill roll imparts a smooth surface to the coating. This technique is used for the back coating of carpeting, and provides a particularly good lock on tufted carpeting.

FIGURE 7



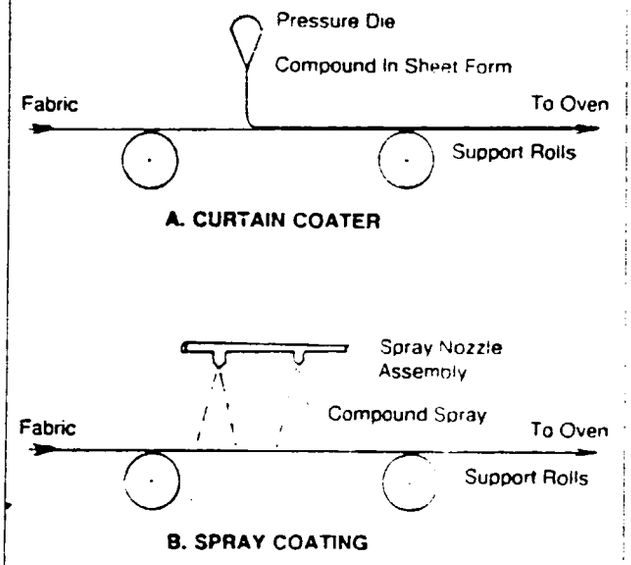
MELT EXTRUSION COATER

Curtain coating (Figure 8A) is a method for applying viscous materials to a substrate without using a knife or roller system to meter the material. In this method, the material is forced, under pressure, from a die that permits it to fall as a free-flowing sheet onto the moving substrate. The substrate then passes through an oven that cures the coating. The setting of the die gap, the viscosity of the coating material, and substrate speed determine the thickness of the coating applied.

Spray coating (Figure 8B) is used to apply low viscosity materials to one side of a fabric that might otherwise be treated using saturation coating techniques. One or more banks of spray nozzles are arranged to give uniform coverage of the moving web, and the coating material is forced through the nozzles by air pressure. The fabric passes into an oven where the coating is dried or cured. This technique is becoming more important throughout industry as an energy and material saving application method. Since the application is made only on one side of the fabric, less coating material is used, and less water or solvent is present to be evaporated, than would be if the fabric was dipped.

Many variations of these coating methods have been developed for industrial use. The selection of the proper

FIGURE 8



method for application of a coating for a particular end use should be made only after consideration of all the viable alternatives. For additional information on coating equipment and processes, and the selection of equipment for various purposes, see, "Coating and Laminating Machines," by Herbert L. Weiss, published by Converting Technology Co., Milwaukee, Wisconsin 53211 (1977).

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By John A. Pasquale III

Laminating

Lamination is the basic process by which fabric for various end products such as tents, awnings, cover materials, boat decking, tarpaulins, brattice cloth, etc., are manufactured. These end products consist primarily of laminates of thermoplastic film and fabrics, often using an adhesive as the tie coat to secure the bond.

The basic concept of lamination involves:

- Unwinding, guiding, and tension control of the individual plies to be laminated.
- Application of the appropriate tie coat adhesive for the bonding process.

-5- 139567 C.TITUS
NO : 147[illegible]
TI : ENDUCTION ET CONTRE-COLLAGE . UNE V[illegible] D'ENSEMBLE .
TO : BESCHICHTEN UND KASCHIEREN - EINE [illegible]EINE EINFUEHRUNG
AU : ANONYM
TD : PERIODIQUE
SO : KETTENWIRK-PRAXIS(KWPX), 1984/08, [illegible].18, NR.8, P.21 (5 P.). FIG.1[illegible]
REF.S. RES.AUT.ALLEMAND, ANGLAIS, [illegible]NCAIS - ALLEMAGNE (REPUBLIQUE
FEDERALE D') (D1)(D104)
LA : ALLEMAND
VD : CO; DI: S2
MF : METAPLAST BABCOCK;BRUECKNER;MENSCH[illegible]R;RAMISCH-KLEINEWEFERS;STROCK;
SALADIN;METAPLAST
RS : DU TISSU MAILLE EST SOUVENT UTILIS[illegible]EN TANT QUE SUBSTRAT POUR
L'ENDUCTION OU LE CONTRE-COLLAGE . [illegible]'ENDUCTION A LA RACLE , L'ENDUC
PAR TREMPAGE . L'ENDUCTION PAR COU[illegible]E ET LA METALLATION SONT EXPLIC
. LES PRODUITS D'ENDUCTION SONT LE[illegible]OLYMERE THERMOPLASTIQUE , LA RE
THERMODURCISSABLE OU DE L'ELASTOME[illegible] A BASE DE POLY(CHLORURE DE VIN
, DE POLYURETHANNE OU D'ACRYLATE . [illegible]E PRINCIPE DE LA MACHINE DE
CONTRE-COLLAGE POUR DU TRICOT CONT[illegible]-COLLE EST EXPLIQUE .

-6- 139350 C.TITUS
NO : 140255
TI : ENDUCTION ET CONTRE-COLLAGE DES TI[illegible]S NON TISSES .
TO : COATING AND LAMINATING NONWOVENS -[illegible]AKING GOOD PRODUCTS EVEN BETTER
AU : VOGEL M.
TD : PERIODIQUE
SO : NONWOVENS INDUSTRY(NWOI), 1983/04, [illegible]OL.14, NR.4, P.26-32 (4 P.), FI
- ETATS-UNIS (F2)(F203)
LA : ANGLAIS
VD : CO; DI; S1
RS : PASSAGE EN REVUE DES PROCEDES DIFF[illegible]ENTS ET DES MACHINES POUR LE
CONTRE-COLLAGE ET L'ENDUCTION DES [illegible]ISSUS NON TISSES . CONTRE-COLLAG
D'UN FILM DE MOUSSE DE POLYURETHAN[illegible]E AVEC UN TISSU NON TISSE PAR L
PAR FLAMME . CONTRE-COLLAGE D'UN F[illegible]M SOUPLE OBTENU PAR EXTR[illegible]SION .
L'ENDUCTION A LA RACLE , L'ENDUCTI[illegible]N PAR TREMPAGE ET L'ENDUCTION AU
DES ROULEAUX GRAVES D'IMPRESSION S[illegible]T MENTIONNEES .

-7- 136994 C.TITUS
NO : 137805
TI : ENDUCTION ET CONTRE-COLLAGE DES TISSUS INDUSTRIELS .
TO : COATING AND LAMINATING PROCESSES
AU : DODGENS W.
TD : PERIODIQUE
SO : INDUSTRIAL FABRIC PRODUCTS "83 BUYERS GUIDE", NUMBER 10A, 1983/02,
VOL.59, NR.10A, P.42-46 (4 P.), FIG.4 - ETATS-UNIS (F2)(F205)
LA : ANGLAIS
VD : CO; DI; S1
RS : PASSAGE EN REVUE DE PLUSIEURS PROCEDES POUR L'ENDUCTION ET LE
CONTRE-COLLAGE DES TISSUS INDUSTRIELS . SCHEMAS DE MACHINES POUR
L'ENDUCTION A LA RACLE , L'ENDUCTION AU ROULEAU ET LE CONTRE-COLLAG
L'AIDE D'UNE FLAMME . UTILISATION D'UN HOT MELT .

-8- 133359 C.TITUS
NO : 133359
TI : NOUVELLES TENDANCES CONCERNANT LES PROCEDES D'ENNOBLISSEMENT EN EUR
.
TO : NEW FASHION TRENDS AND FINISHING IN EUROPE
AU : JERG G.
TD : PERIODIQUE
SO : CANADIAN TEXTILE JOURNAL(CTJO), 1982/06, VOL.99, NR.6, P.11-14 (4 P
FIG.1 - CANADA (F2)(F205)
LA : ANGLAIS
VD : CO; DI: S1
MF : SCOTCHGARD FC 232;HYDROPHOBOL SL PFL CIBA-GEIGY
RS : HISTORIQUE DU DEVELOPPEMENT DES AGENTS D'APPRET POUR ARTICLES TEXTI
. ENDUCTION A LA RACLE . PRODUCTION DE TISSUS DE COTON ET DE TISSUS
MIXTES COTON/POLYESTER AVEC UNE ENDUCTION TRES FINE POUR LES VETEME
DE LOISIRS . RECETTE POUR L'ENDUCTION DES POPELINES DE COTON POUR

MF : SCOTCHGARD FC 232;HYDROPHOBOL SL [illegible] CIBA-GEIGY
RS : HISTORIQUE DU DEVELOPPEMENT DES AGENTS D'APPRET POUR ARTICLES TEXTI
. ENDUCTION A LA RACLE . PRODUCTION DE TISSUS DE COTON ET DE TISSUS
MIXTES COTON/POLYESTER AVEC UNE ENDUCTION TRES FINE POUR LES VETEME
DE LOISIRS . RECETTE POUR L'ENDUCTION DES POPELINES DE COTON POUR
VETEMENTS DE PLUIE ET VETEMENTS DE SPORT .
- NOUVEAUX AGENTS D'APPRET POUR VETEMENTS DE PECHEURS . UN TRAITEME
AVEC UNE SILICONE RENFORCE L'ELASTICITE D'UN TISSU ELASTIQUE EN SPA
OU EN FILS TEXTURES . RECETTE POUR CHEMISE COTON/POLYESTER . TRAITE
ALCALIN DES TISSUS DE POLYESTER POUR CORSAGES . UN TRAITEMENT
ADOUCISSANT FACILITE LE GRATTAGE DES TISSUS CHAINE ET TRAME ET DES
TISSUS MAILLE .

-9- 130689 C.TITUS
NO : 131E9
TI : PASSAGE EN REVUE DES PROCEDES D'ENDUCTION DES TISSUS INDUSTRIELS .
TO : COATING INDUSTRIAL FABRICS - A REVIEW
AU : LATTS B.M.
TD : PERIODIQUE
SO : JOURNAL OF COATED FABRICS(JCFA), 1982/01, VOL.11, NR.3, P.113-121 (
P.), FIG.5 - ETATS-UNIS (F2)(F205)
LA : ANGLAIS
VD : C0; D2; S1
RS : TOUS LES PROCEDES D'ENDUCTION (ENDUCTION AU ROULEAU, ENDUCTION A LA
CALANDRE, ENDUCTION PAR TREMPAGE, ENDUCTION PAR COULEE, ENDUCTION A
RACLE) SONT DECRITS .

-10- 130611 C.TITUS
NO : 131510
TI : APPRET EN BAIN MOUSSANT .
TO : FOAM PROCESSING TECHNIQUES
AU : AVRIL N.
AF : VALCHEM
TD : PERIODIQUE
SO : AUSTRALASIAN TEXTILES, 1981/01-02, VOL.1, NR.1, P.13-24 (2 P.), TAB
FIG.2 - ETATS-UNIS (GS)(GS09)
LA : ANGLAIS
VD : C0; D2; S2
RS : L'APPRET EN BAIN MOUSSANT ET LA TEINTURE EN BAIN MOUSSANT PAR ENDUC
A LA RACLE OU FOULARDAGE SONT DECRITS . LES AVANTAGES DE L'APPRET E
BAIN MOUSSANT ET DE LA TEINTURE EN BAIN MOUSSANT EN RELATION AVEC L
COUTS , L'EAU RESIDUAIRE , LA CONSOMMATION DE MOUSSE , LES PROPRIET
DU TISSU ET L'ECONOMIE D'ENERGIE SONT DISCUTES .

COMMANDE, 02 ETAPE DE RECHERCHE 4

?..vi se 11 a 14 mazx - /de et 1

-11- [illegible] C.TITUS
NO : 130911
TO : MOUSSES MECANIQUES POUR L'ENDUCTION DES TAPIS ET MOQUETTES.
AU : BERTHEVAS P;
AF : B.P. CHIMICALS
TD : PERIODIQUE
SO : IND. TEXTILE(INTP), 1981/06, NR.1123, P.535-537 (3 P.), TAB.1, FIG.
RES. ALT.FRANCAIS, ANGLAIS, ALLEMAND - FRANCE (F2)(F208)
LA : FRANCAIS
VD : C0; D2; S2
RS : LES METHODES UTILISEES POUR LA PREPARATION DE LA MOUSSE DE
POLYURETHANNE SONT DECRITES . CAS PARTICULIER DES MOUSSES DE
POLYURETHANNE POUR L'ENDUCTION D'ENVERS DE TAPIS . LA PREPARATION I
MOUSSE DE POLYURETHANNE SELON LA METHODE DE "B.P. CHIMICALS" EST
EFFECTUEE PAR L'INJECTION D'UN GAZ INERTE (AIR) DANS LES COMPOSANTS
LIQUIDES (POLYOL, ISOCYANATE, CATALYSEUR) . MELANGE INTENSIF DE CES
COMPOSANTS PAR MOUVEMENTS MECANIQUES .
- SCHEMA ET EXPLICATION CONCERNANT L'EQUIPEMENT POUR LA PREPARATION
LA MOUSSE ET L'ENDUCTION A LA RACLE . LES AVANTAGES DE CETTE METHOD
SONT DECRITS PAR RAPPORT AU PROCEDE D'ENDUCTION AVEC DES MOUSSES A
DE LATEX

[illegible] LA PULVERISATION , DU PROCEDE PAR EPUISEMENT ET DE L'APPLICATION DE LA MOUSSE EST DECRITE . DES APPAREILS DE MESURE ET DES SYSTEMES DE REGULATION POUR MACHINES D'ENNOBLISSEMENT SONT EXPLIQUES . LES PROCEDES POUR LE PRETRAITEMENT (FLAMBAGE, DESENCOLLAGE, BLANCHIMENT, ESSORAGE, SECHAGE) SONT COMMENTES . DESCRIPTION DETAILLEE DU GRATTAGE , DU RASAGE , DU BROSSAGE ET DU RETRAIT .
- EXPLICATIONS DU DECATISSAGE , DU CALANDRAGE , DU FOULAGE ET DU GAUFRAGE . LES DETAILS DE CONSTRUCTION DES MACHINES D'ENNOBLISSEMENT , LE MODE OPERATOIRE ET LES CAUSES DES DEFAUTS PENDANT L'ENNOBLISSEMENT SONT DECRITS . LES AGENTS D'APPRET DIFFERENTS (AGENT ADOUCISSANT, AGENT HYDROFUGE, AGENT D'APPRET INFROISSABLE, AGENT RAIDISSANT, AGENT IMPERMEABILISANT) , LES AGENTS RETARDATEURS DE L'IGNITION , LES AGENTS ANTISTATIQUES , LES AGENTS ANTIMITES ET LES AGENTS D'OLEOFUGATION SONT ETUDIES . LES PROCESSUS SUCCESSIFS DE L'ENNOBLISSEMENT DE QUELQUES ARTICLES TEXTILES SONT ENUMERES .

(24) 148226 C.TITUS
NU : 149133
TI : L'ENDUCTION, UNE PALETTE DE TECHNIQUES
AU : ANONYME
TY : PERIODIQUE
SO : PLASTIQUES MODERNES ELASTOM.(IPLA), 1984/09, VOL.36, NR.7, P.58-61 (4 P.), FIG.10 - FRANCE (F2)(F202)
LA : FRANCAIS
VT : C0; D2; S2
RE : PASSAGE EN REVUE DES PROCEDES D'ENDUCTION DIFFERENTS . L'ENDUCTION DIRECTE , L'ENDUCTION PAR TRANSFERT , L'ENDUCTION A LA RACLE , L'ENDUCTION AU CADRE ROTATIF ET L'ENDUCTION AU ROULEAU SONT COMMENTES . LE CONTRECOLLAGE ET LES HOT MELTS SONT EGALEMENT CONSIDERES .

DE L'EX .

-12- 129813 C.TITUS
NO : 130686
TI : LE MARCHE DES TISSUS INDUSTRIELS A UN BON AVENIR .
TO : TECHNISCHE TEXTILIEN - EIN MARKT MIT GUTER ZUKUNFT.
AU : ENGLISH
AF : VERSEIDAG, KREFELD;
TD : PERIODIQUE
SO : CHEMIEFASERN(CMFS), 1981/10, VOL.31/83, NR.10, P.750 (1 P.) - ALLEM (REPUBLIQUE FEDERALE D') (D1)(D104)
LA : ALLEMAND
VD : CO; D1; S1
MF : VERSEIDAG, KREFELD
RS : LES TISSUS INDUSTRIELS REPRESENTENT 32 % DU CHIFFRE D'AFFAIRES DE "VERSEIDAG" .
- DES FIBRES DE POLYESTER ET DES FILS DE FILAMENTS DE POLYAMIDE SON UTILISES POUR LA FABRICATION DE TISSUS CHAINE ET TRAME POUR DES FIL ET IMPRESSION AU POCHOIR . DES FIBRES SYNTHETIQUES , DES MONOFILAME , DES FILS MULTIFILAMENTS ET DES FILES PEUVENT ETRE UTILISES . DES TISSUS ENDUITS SONT PRODUITS A L'AIDE DE L'ENDUCTION PAR TREMPAGE , L'ENDUCTION PAR COULEE OU DE L'ENDUCTION A LA RACLE . D'AUTRES ARTI TEXTILES IMPORTANTS SONT LES TISSUS CHAINE ET TRAME AVEC UNE STABIL THERMIQUE ELEVEE POUR DES VETEMENTS DE PROTECTION RESISTANT A LA CHALEUR . PASSAGE EN REVUE DES TISSUS EN POLYAMIDES AROMATIQUES , E FIBRES DE CARBONE , EN FIBRES DE VERRE ET EN D'AUTRES FIBRES A HAUT TENACITE .

-13- 129833 C.TITUS
NO : 129796
TI : APPAREIL ET METHODE POUR L'ENDUCTION D'ENVERS DES TAPIS AVEC UNE MO DE LATEX .
TO : APPARATUS FOR AND METHOD OF COATING A WEAR LAYER OF A CARPETING STF WITH CURABLE LATEX FOAM.
AU : MC LEAN M.E.;ENSLEY R.N.;HAREN D.V.DAYCO CORPORATION
TD : BREVET
SO : US 4239821 (IPC B32B3/00), ETATS-UNIS, DEPOT 1979/04/10, DELIV. 1980/12/16 (XS)(GS15)
LA : ANGLAIS
VD : CO; D2; S2
RS : LE REMPLACEMENT CONTINU DU BORD DE LA RACLE PENDANT L'ENDUCTION A L RACLE POUR L'ENDUCTION D'ENVERS DES TAPIS AVEC DES MOUSSES DE LATEX BREVETE .

-14- 128169 C.TITUS
NO : 129033
TI : PROCEDE A LA CONTINUE ET ASSORTIMENT DE TEINTURE A LA CONTINUE POUF TEINTURE EN BAIN MOUSSANT .
TO : VERFAHREN ZUM KONTINUIERLICHEN BESCHAEUMEN EINES TEXTILEN FLAECHENGEBILDES UND VORRICHTUNG ZUM DURCHFUEHREN DAS VERFAHREN.
AU : VAN [illegible]RSCH K.;PABST M.FA.A.MONFORTS
TD : BREVET
SO : DE 2[illegible]797, DOS (IPC D06P07/00), ALLEMAGNE (REPUBLIQUE FEDERALE D') DEPOT 1979/10/01, DELIV. 1981/04/16 (D1)(D105)
LA : ALLEMAND
VD : CO; D2; S2
RS : LE BREVET CONCERNE LA TEINTURE OU L'ENNOBLISSEMENT AU MOYEN D'UN PROCEDE D'ENDUCTION PAR TRANSFERT ET DE L ENDUCTION A LA RACLE .
- SCHEMA DE L'ASSORTIMENT DE TEINTURE A LA CONTINUE .

COMMANDE, OU ETAPE DE RECHERCHE 4

?..st fi

-1- 151481 C.TITUS
NO : 152389
TI : L'APPLICATION DES MATIERES PLASTIQUES DANS L'INDUSTRIE TEXTILE .
TO : TEXTILVEREDLUNG - WISSENSCHAFTLICH-TECHNISCHER FORTSCHRITT IN DER TEXTILINDUSTRIE-KUNSTSTOFFAPPLIKATION IN DER TEXTILINDUSTRIE
AU : HEINZE W.
TD : OUVRAGE
SO : 1981, VOL.1, TOME5, P.99 (67 P.), TAB.12, FIG.58, REF.14 - ALLEMANDE (REPUBLIQUE DEMOCRATIQUE) (D1)(D113) , 1280
LA : ALLEMAND
VD : C0; D2; S2
ED : VEB FACHBUCHVERLAG (LEIPZIG)
MF : DEDERON;NYLON;RILSAN
RS : DESCRIPTION DETAILLEE DE LA FABRICATION DE STRATIFIES , DE LAMINES SANDWICH ET DE TISSUS NON TISSES . L'UTILISATION DU POLY(CHLORURE DE VINYLE) , DU POLYETHYLENE , DES POLYAMIDES (POLYAMIDE-6, POLYAMIDE-6-6, POLYAMIDE-11) , DU POLY(ACETATE DE VINYLE) ET DES ESTERS D'ACIDE POLYACRYLIQUE EST ETUDIEE . L'UTILISATION DE CAOUTCHOUC SYNTHETIQUE ET DE PLUSIEURS POLYURETHANNES EST EGALEMENT ETUDIEE . LES MACHINES ET LES PROCEDES (FOULARDAGE, ENDUCTION A LA RACLE, PULVERISATION, ENDUCTION AU ROULEAU, FUSION) SONT DECRITS .
- UN TABLEAU MONTRE LES DOMAINES D'UTILISATION DES POLYMERES LES PLUS IMPORTANTS EN CE QUI CONCERNE LA CONSOLIDATION ET L'ENDUCTION . DES COLORANTS , DES PLASTIFIANTS , DES STABILISANTS ET DES PRODUITS CHIMIQUES TEXTILES SPECIFIQUES SONT MENTIONNES . LA FABRICATION DES TISSUS AU MOYEN DE LIAGE PAR FLAMME , DE POLYMERES THERMOPLASTIQUES , DE POUDRE THERMOPLASTIQUE OU D'ADHESIFS EST DISCUTEE EN RELATION AVEC QUELQUES DOMAINES D'UTILISATION DE LA CONFECTION ET CERTAINES METHODES D'ESSAI CONCERNANT LES PROPRIETES D'USAGE .

-2- 151369 C.TITUS
NO : 152276
TI : LES ENDUCTIONS
AU : ANONYME
TD : PERIODIQUE
SO : REV. ENT. TEXTILES-NETTOYAGE(RETN), 1985/01-02, VOL.8, NR.62, P.13-21 (8 P.), FIG.5 - FRANCE (F2)(F202)
LA : FRANCAIS
VD : C0; D2; S2
RS : LES PRINCIPALES TECHNIQUES D'ENDUCTION DIRECTE ET D'ENDUCTION PAR TRANSFERT SONT DISCUTEES EN FONCTION DU SUBSTRAT ET DU DOMAINE D'UTILISATION DU TISSU ENDUIT . PLUSIEURS SCHEMAS MONTRENT LES METHODES DIFFERENTES D'ENDUCTION A LA RACLE . LES PRODUITS D'ENDUCTION (POLY(CHLORURE DE VINYLE), RESINE ACRYLIQUE, POLYURETHANNE, CAOUTCHOUC) SONT ETUDIES EN RELATION AVEC LE COMPORTEMENT PENDANT LE NETTOYAGE A SEC .

-3- 150812 C.TITUS
NO : 151719
TI : MACHINES ET PROCEDES POUR L'ENNOBLISSEMENT .
TO : TEXTILVEREDLUNG - APPRETIEREN - MASCHINEN - VERFAHREN
AU : BUDDE H.E.;KUBITZA K.;NEUMANN P.;PAHL S.;PESCH W.;POGORZELSKI W.; SCHNEPP F.;WALBRECHT R.
AF : GESAMTTEXTIL (FRANKFURT)
TD : RAPPORT DIVERS
SO : AUSBILDUNGSMITTEL UNTERRICHTSHILFEN, 1983/04, VOL.1, P.1 (226 P. , TAB.3, FIG.131 - ALLEMAGNE (REPUBLIQUE FEDERALE D') (D1)(D116) , 1130
LA : ALLEMAND
VD : C0; D3; S3
ED : GESAMTTEXTIL (FRANKFURT)
RS : LA DESCRIPTION DETAILLEE DE L'ENDUCTION A RACLE , DU FOULARDAGE , DE