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Cottage Industry Manuals

Three Dimensional Woven Bamboo Products

EASTERN AFRICA BAMBOO PROJECT

funded by



executed by



supervised by



ETHIOPIA
Ministry of Agriculture and Rural Development
Federal Micro and Small Enterprise
Development Agency

KENYA
Kenya Forestry Research Institute

COTTAGE INDUSTRY MANUALS

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I. THREE DIMENSIONAL WOVEN BAMBOO PRODUCTS

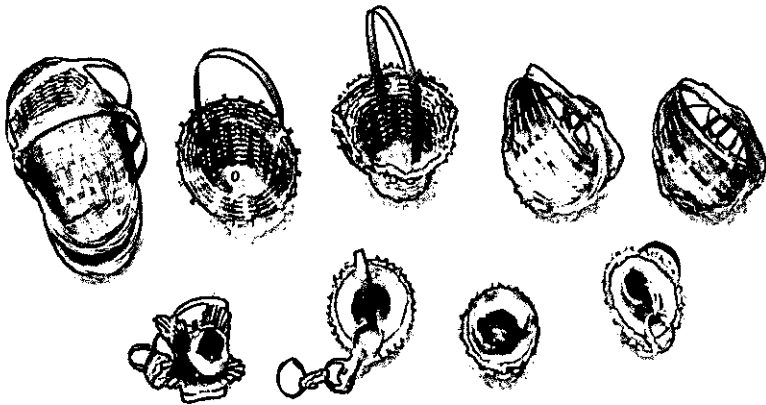
Three dimensional bamboo woven products are handicrafts made of bamboo strips and threads.

The product range is very wide. The products are classified according to their form and function. Some examples include baskets, basins, caps, boxes and cases, tableware, lampshades, and decorative figures in shapes of animals.

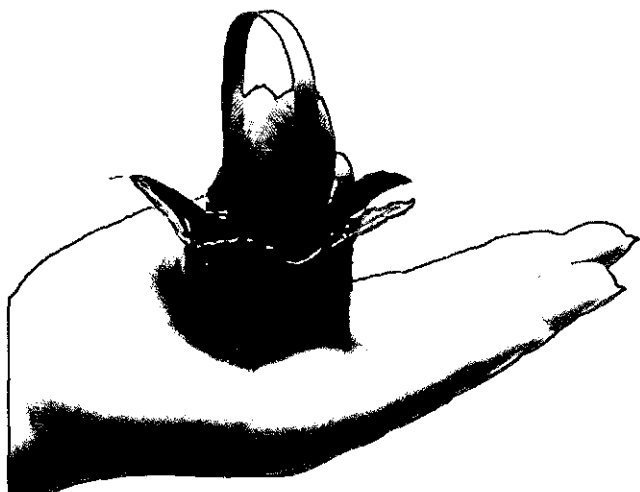
This section provides photos of some common 3 dimensional woven bamboo products from China.

A. *Portable Basketry*

Portable basketry refers to baskets with a handle. There are many kinds of portable baskets. Some are made specifically for carrying flowers, or fruits and vegetables. Portable baskets are made in a wide variety of shapes and sizes, ranging from fancy miniature baskets to large and strong baskets that can carry a load of up to 100 kg.



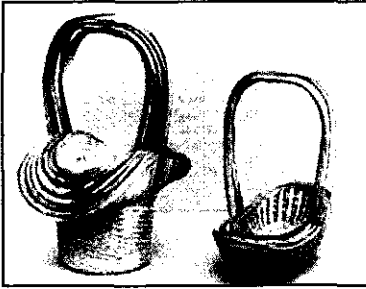
Portable baskets are made in a variety of shapes and sizes.



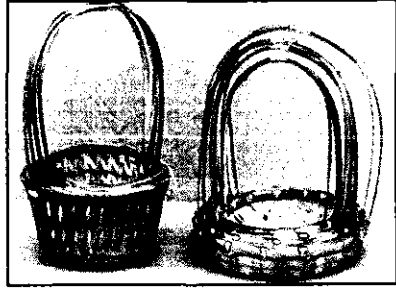
A fancy miniature portable basket



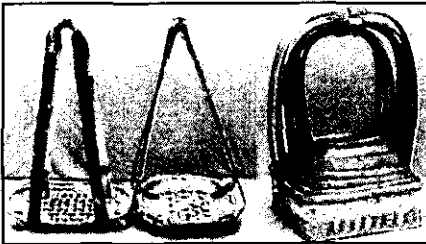
Fancy portable baskets in animal shapes



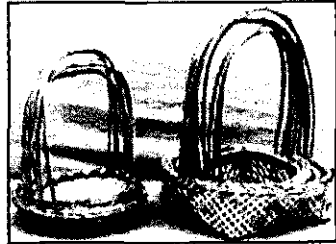
Round basketry



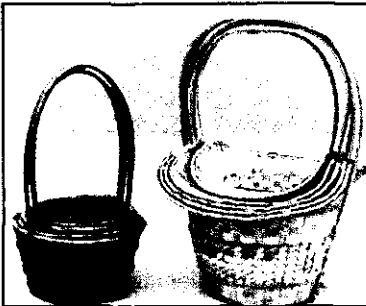
Baskets with tied up fringes



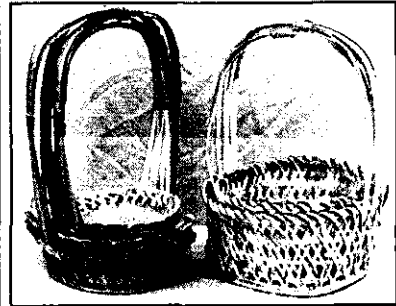
Vegetable baskets & square baskets



Flower Baskets



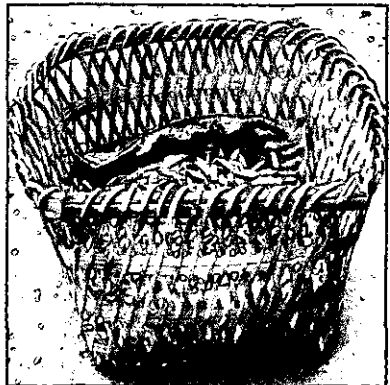
Barrel baskets



Baskets with wavy fringes

B. Storage Basketry

Storage basketry usually refers to rough woven baskets made from bamboo strips. Some baskets are loosely woven while others are tightly plaited. These baskets serve many domestic purposes but are especially used for storing fruits and vegetables.



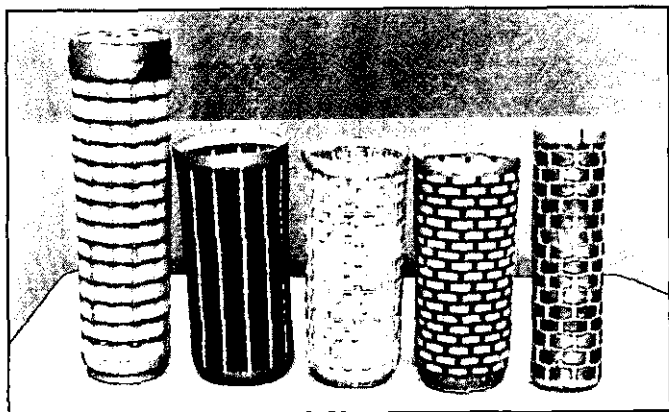
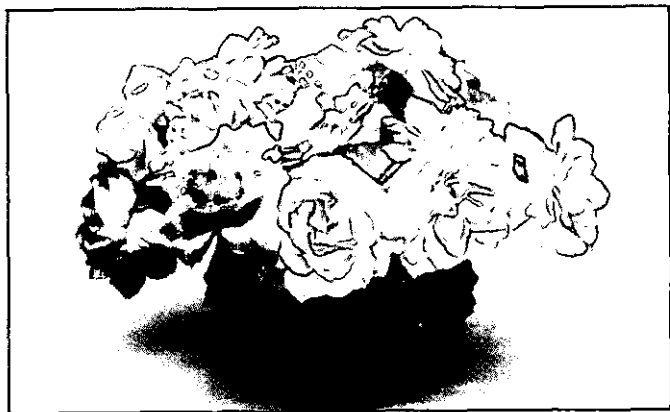
Top left: Tightly Plaited Basket
Bottom Left: Backpack Basket

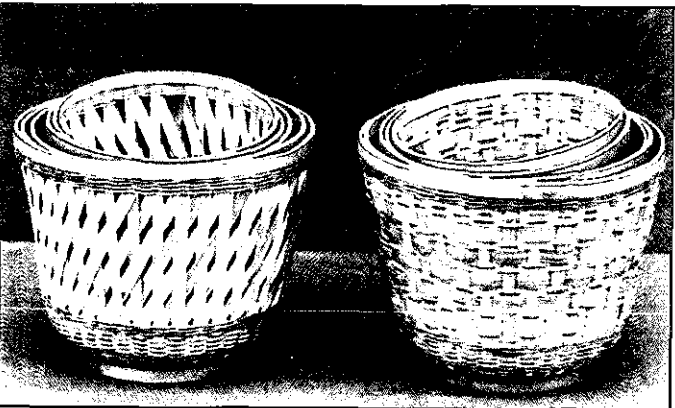
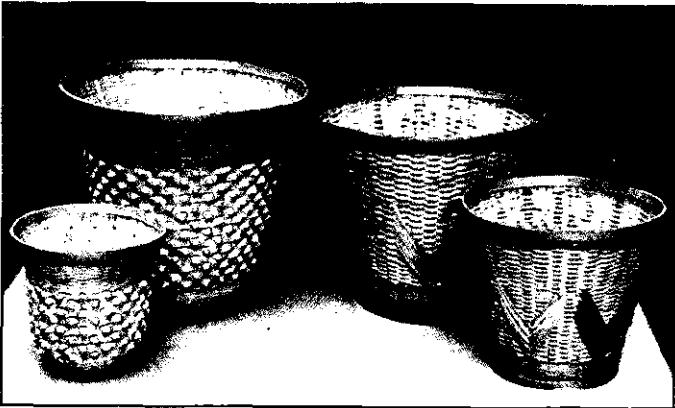
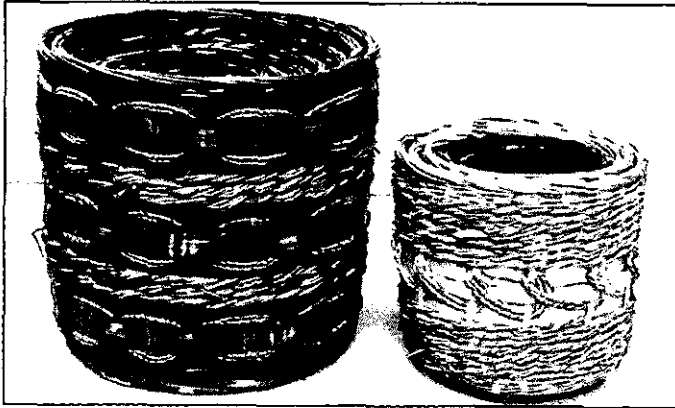
Top Right: Fruit Basket
Bottom Right: Vegetable Basket

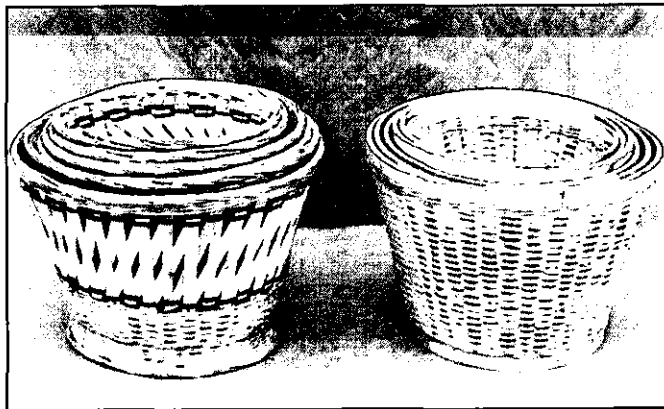
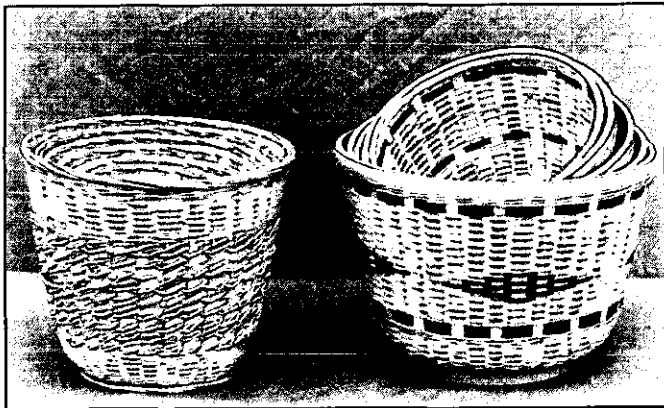
C. *Basin-Shaped Baskets*

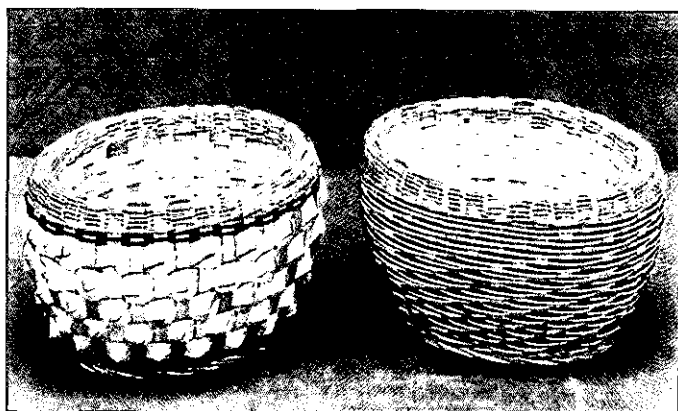
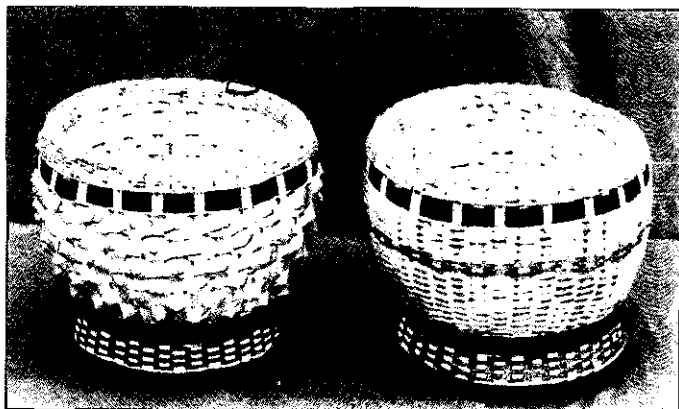
There are many kinds of basin-shaped bamboo baskets for numerous uses. Some are used for holding flower pots and vases, pots for plants, and fruits. Basin-shaped bamboo baskets are widely exported from China and other countries to markets in the USA and Europe.

Some typical examples of basin-shaped baskets are shown in the following pages.





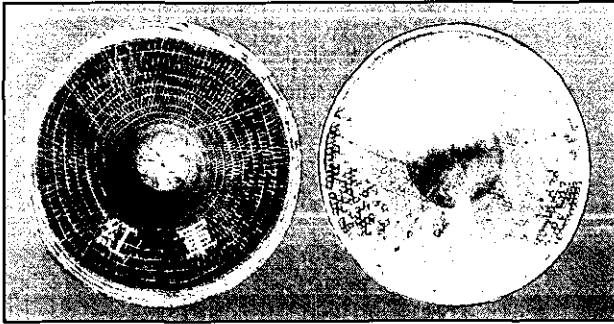




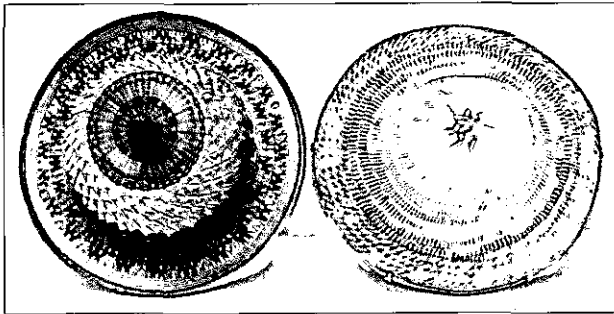
D. Woven Bamboo Caps and Hats

The utilization of bamboo material for weaving hats and caps has a long history. In China hand weaving hats from bamboo is an ancient folk art. One of the first styles was the round rain hat, which dates back to ancient China. The weaving technique of these hats is regarded as exquisite to this day, and manifests the sophisticated weaving skills of people from ancient times. Throughout the ages, woven bamboo hats have protected people from the rain and hot sun. Hats are produced for persons of all ages, ethnic groups, and social classes. During World War II, the Red Army adopted the Sichuan rain hat, which became

known as the Red Army Hat. The Sichuan rain hat, the hat of minority Li (viz., Hainan rain hat), and hat of minority Bai (viz., Yunnan Hat) have very unique features and make use of intricate weaving patterns.



Red Army Hat & Typical Chinese Rain Hat

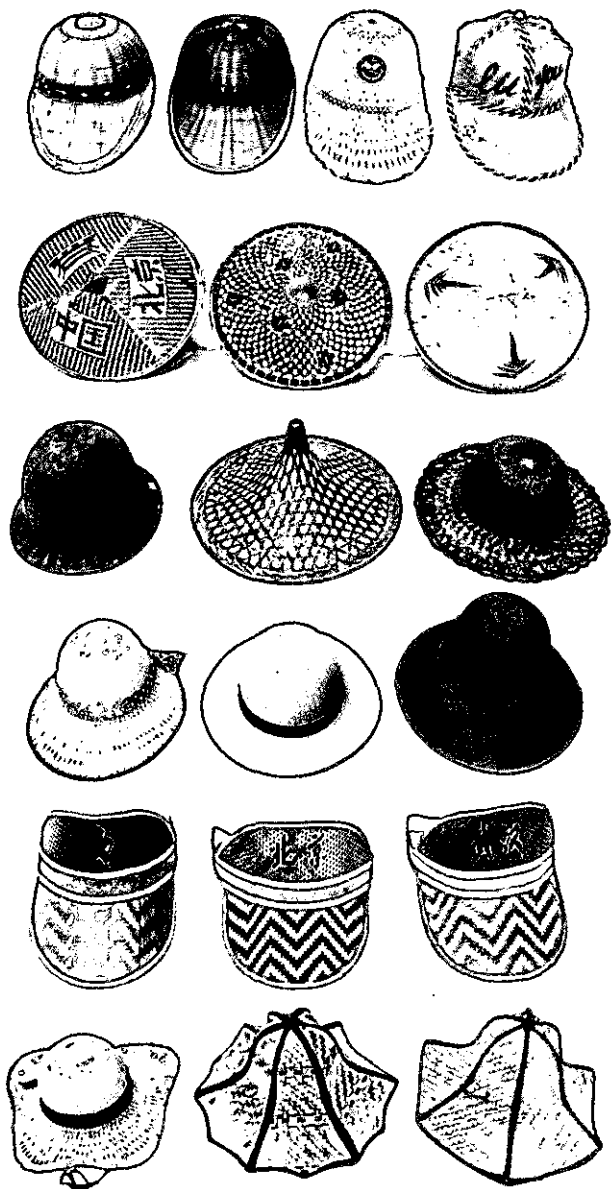


Hats of Ethnic Minorities of China

With the development of tourism industry in China, bamboo woven hats have become popular because of their functionality, originality, and high quality.

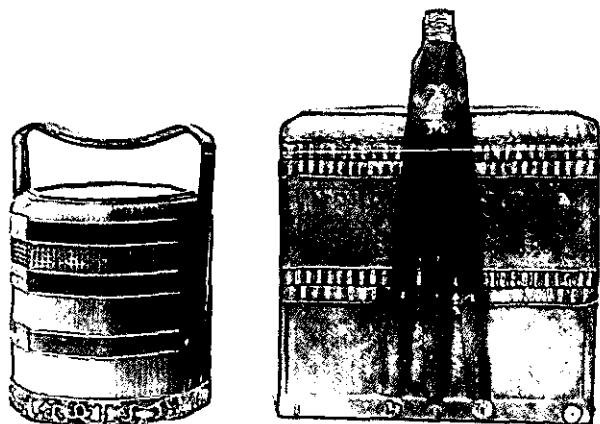
The production of woven hats from bamboo is now a very big industry and a wide range of product designs are available. Some examples are shown below.

Samples on Bamboo Woven Hats and Caps

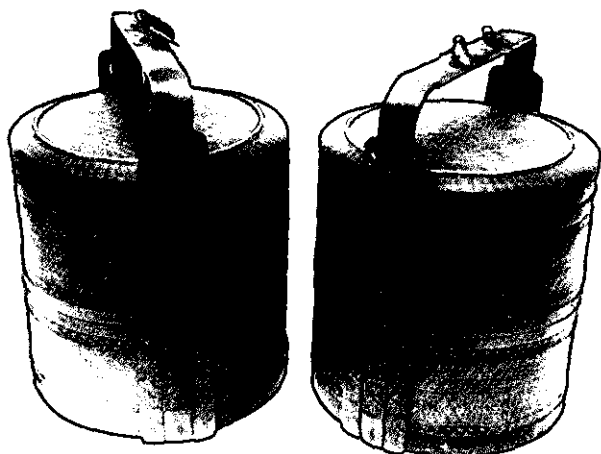


E. Woven Bamboo Containers and Packaging

The utilization of bamboo for weaving cases and boxes can be traced back in historically to the Shang and Zhou dynasty in China. Bookcases, food containers, and boxes for many other domestic items, woven using bamboo fibers, were widely used in ancient times.



Ming dynasty cake container and Song dynasty Bookcase



Food containers of the Qing Dynasty

In present times, the industry for bamboo woven boxes and cases is very large and products are highly diversified.



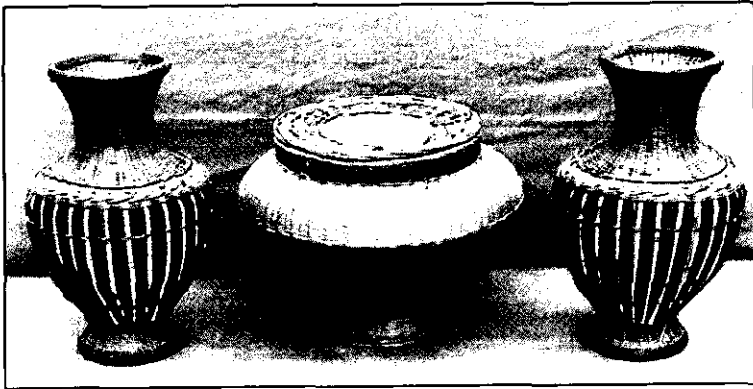
A Family Workshop



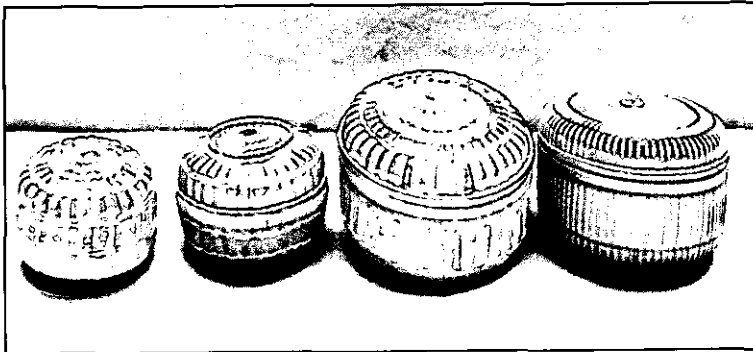
Selling Woven Bamboo Cases

With the growing requirements and demands of modern commerce and trade, woven bamboo is increasing being used for packaging food products. The designs and colors of these woven items are adapted to the demands of the market and to the changing tastes of society.

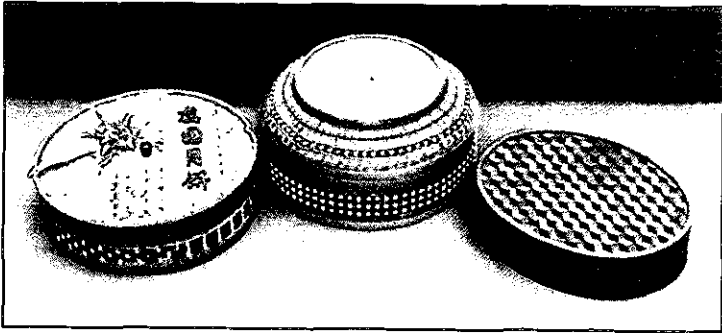
Some examples of woven bamboo cases and boxes are shown below.



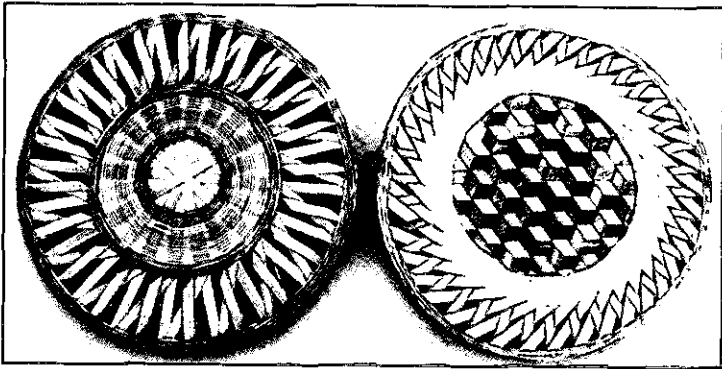
Vase shaped Containers



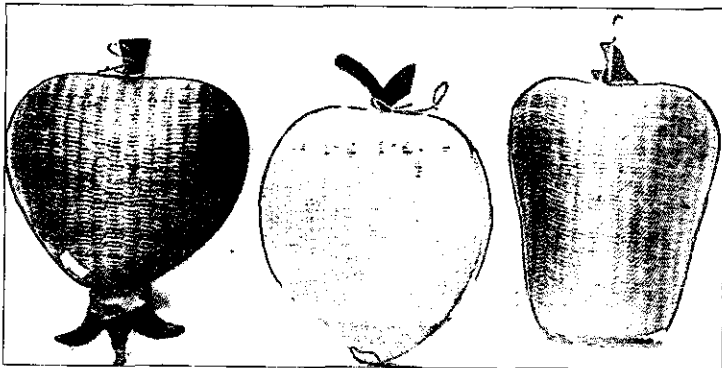
Traditional Food Containers



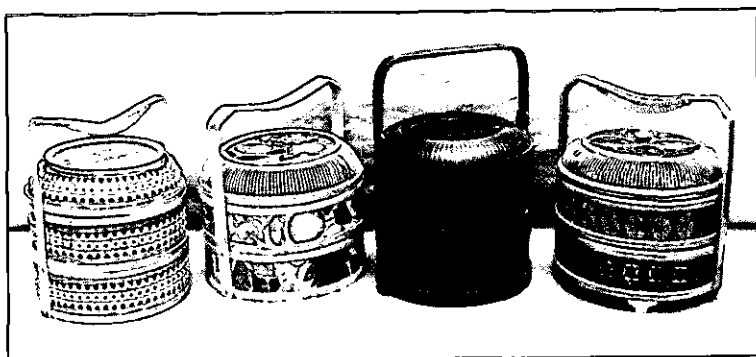
Food Containers



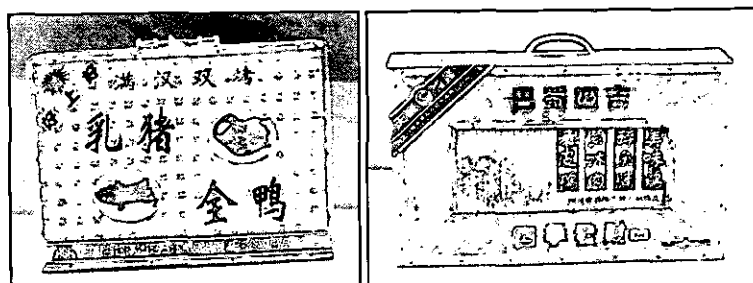
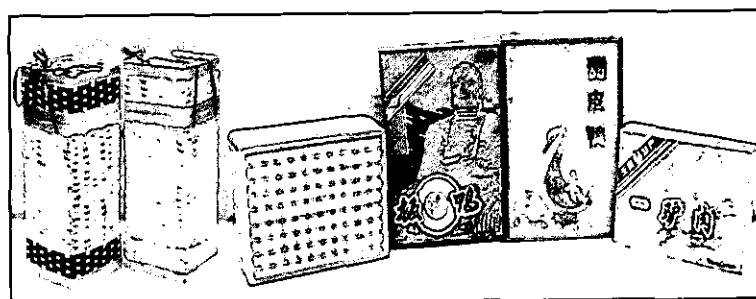
Packaging for Cakes



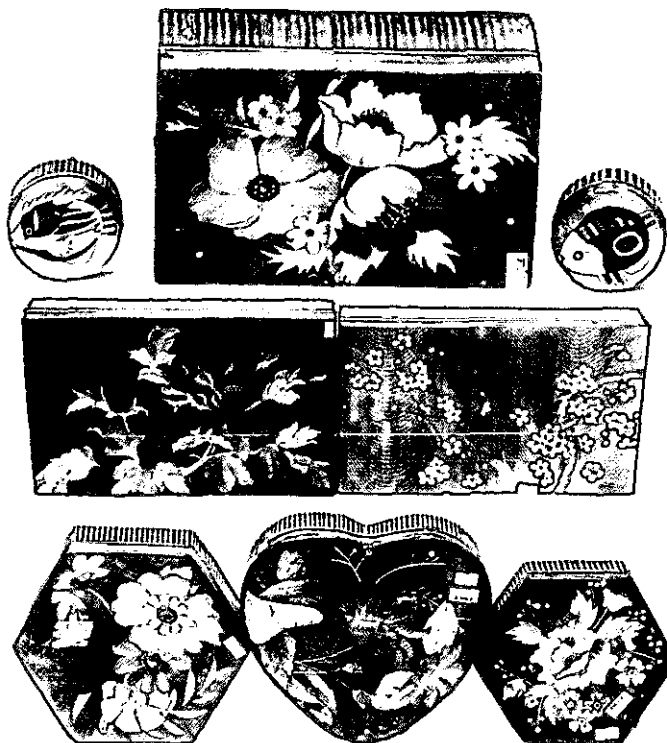
Packaging for Fruits



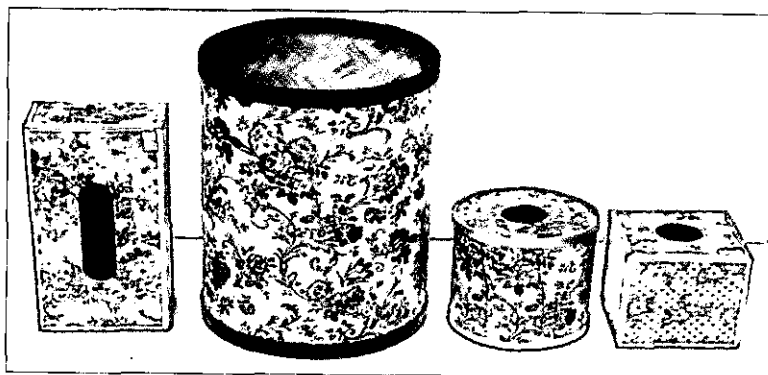
Portable Food Containers



Special Food Packaging



Fancy Packaging for Special Items



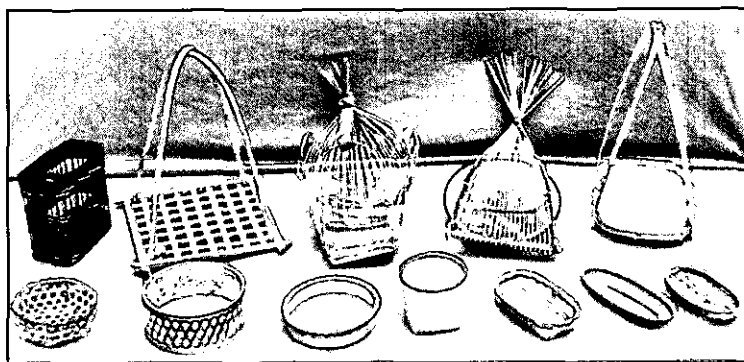
Dustbin and Tissue Boxes

F. Kitchen Utensils

Kitchen utensils comprise another products range within the group of three dimensional bamboo woven items.

There is a wide assortment of bamboo kitchen utensils such as bowls, cups, chopsticks, spoons, steamers, etc. The international market for these products is growing rapidly, which coincides with the demand for bamboo shoots and Asian cuisine in general. Bamboo cooking utensils are popular because of their environmental friendly nature.

Woven cooking utensils of bamboo are mainly containers used for cooking, and serving food, as shown in the picture below.



G. Bamboo Lampshades

Bamboo lampshades have evolved from traditional lanterns which provided light by means of a candle. Since lanterns are woven with thin bamboo strips, they are translucent and provide good illumination. In addition, the woven material limits the air flow to pass through, thereby protecting the candle's flame from strong gusts of wind. Because of this, it is no surprise that the bamboo lantern continues to be widely utilized, especially in rural areas.

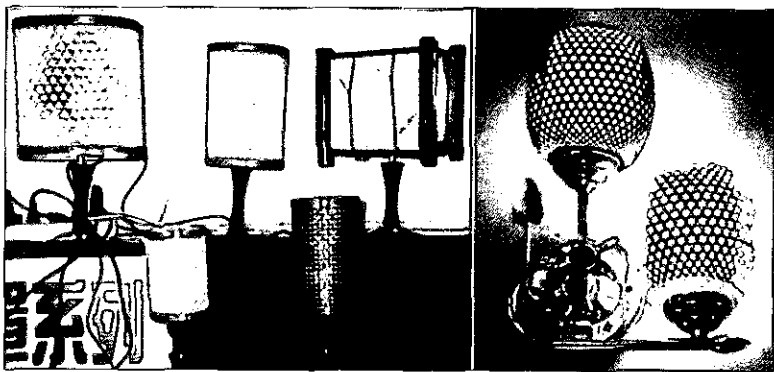
With the advent of electric light, traditional lanterns were transformed into lampshades, many of which are not only functional, but also very

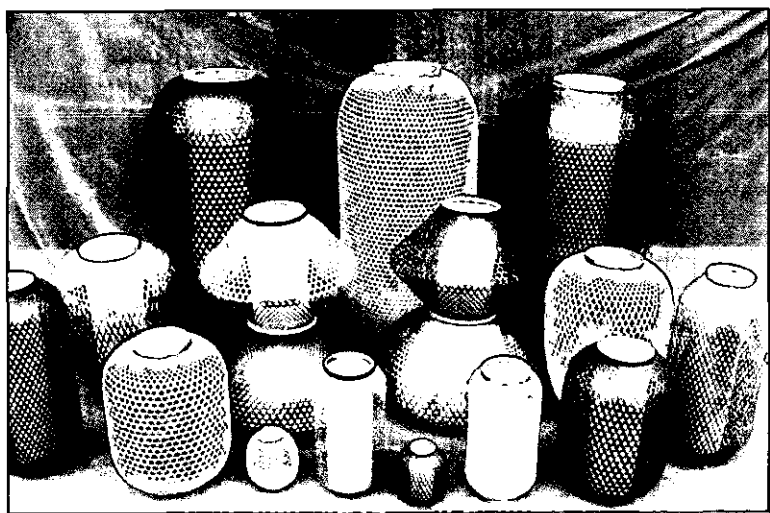
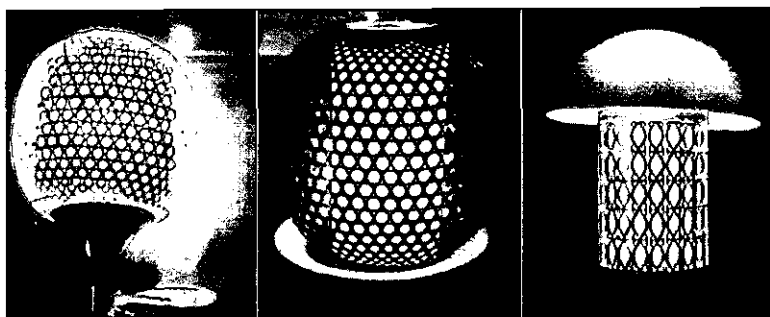
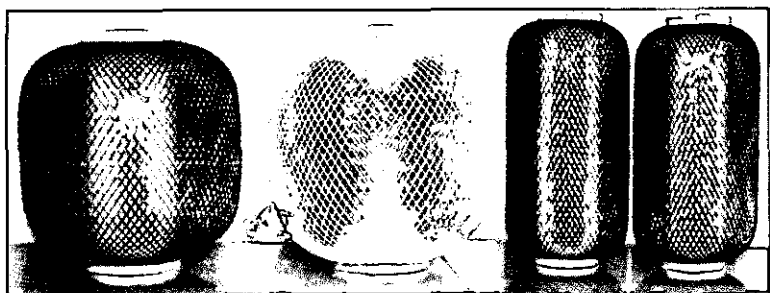
stylish. Nowadays, bamboo lampshades are used for many types of lighting, including reading lamps, hanging lamps, and floor lamps.

Bamboo lampshades are still commonly used in traditional Chinese decor and are typically found in tea houses and classical buildings. The environmental benefits of bamboo, has stimulated the demand for woven lampshades in the international market. Bamboo lampshades are now quite common in many modern style buildings.



Many lampshade products are manufactured in family owned workshops, such as in the picture above. But there are many companies with modern facilities making these products in China and other countries such as Thailand. New designs are constantly being developed to keep up with market demand and to develop new fashionable trends of interior design and lighting. Some examples are shown below.

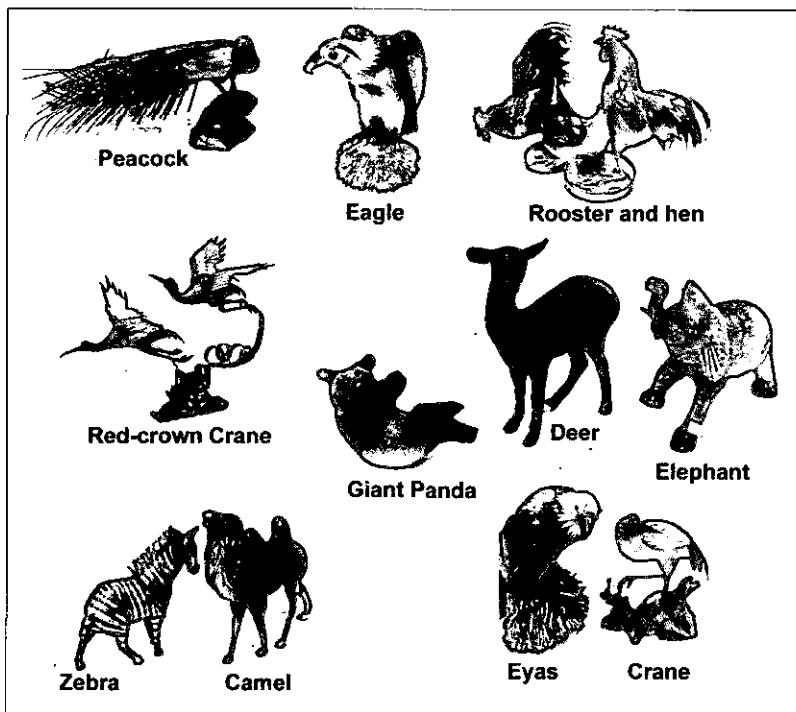




H. *Bamboo Woven Figurines*

Making 3 dimensional figurines using bamboo strips is an art form requiring high precision weaving skills. In Zhejiang province of China, figurines of animals are commonly made. Some figurines are very fine works with a high artistic and economic value.

Some examples are shown below.



II. PROCESSING OF MATERIALS

A. *Making of Strips*

The processing of raw material for 3 dimensional woven bamboo products is identical to the methods used in plane weaving. This includes all the steps involved in making fine strips. For 3 dimensional

weaving very long strips of bamboo are usually required. The selection of raw materials is therefore important and it will be necessary to divide the culms into long sections with several internodes. Prior to making the strips, the nodes on the slivers will have to be removed. Only then will it be possible to produce very fine and even strips.

B. Bleaching and Dyeing

The techniques of dyeing and bleaching the strips are also the same as those used for plane woven products.

Bleaching can be done by immersing the strips in a hydrogen peroxide (H_2O_2) solution using a concentration of 1:1 (i.e. 1 unit H_2O_2 per unit of water) or by boiling them in a mixture with a concentration of 1 unit H_2O_2 per 3 units of water.

Bamboo strips can also be colored using diluted dyestuff.

C. Preservation Treatment

The preservation treatment for bamboo strips can be done in two steps.

1. When bamboo strips are boiled during the bleaching process, they will gain resistance against pests.
2. Dipping the strips in special anti-mildew chemical will protect them from fungal attacks and increase their life.

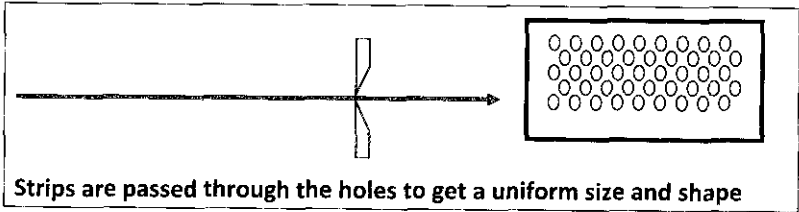
D. Modifications for Strip Uniformity

In order to have strips with the same size and shape, the strips need to be processed using a modification knife. There are mainly 3 methods types of modification knives: round, straight and radian knives.

1. Round Modification Knife

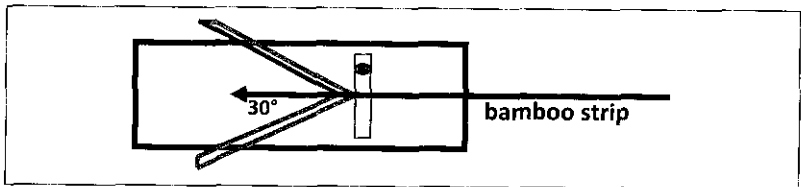
- Prepare a piece of thick armor plate with size of 20 cm long by 7cm wide.
- Drill holes on the armor plate with a diameter according to the required size of the bamboo strips.

- Fix the armor plate on the shelf.
- Pull the bamboo strips through the holes to get evenly rounded strips of the required size.



2. Straight Modification Knife

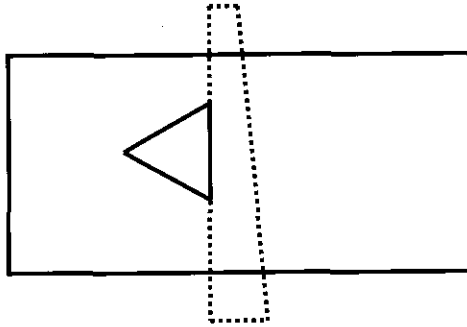
- Prepare a wood board with a size of 20cm long by 10 cm wide by 3 cm thick.
- On the midpoint of width of the board, make two diagonal grooves forming a 30° angle (as shown in the image below).
- Fix two knives into the grooves with the blades towards the inside. Adjust the space between two blades to the required size of bamboo strips.
- Pull the strips through the blades to get strips with of an even size, as shown in the following image.



3. Radian Knife

- Prepare a wooden board with a size of 20 cm long by 15 cm wide and a thickness of 3 cm.
- Cut a hole in the board in the shape of an equilateral triangular with sides 3cm in length as shown in the images below.

- Cut a groove on the board and fix a scalar knife with radian blades into the triangle hole. Adjust the space between two blades to the required size.

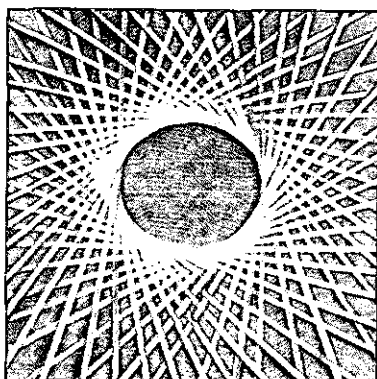


Strips are shaped to uniform sizes with a radian knife

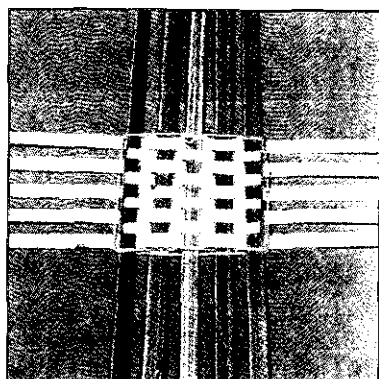
III. THREE DIMENSIONAL BAMBOO WEAVING

A. *Type of Starts*

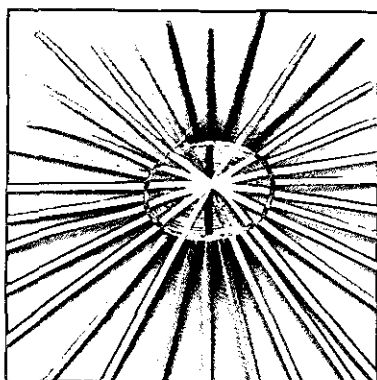
There are three main types of starts in the 3 dimensional weaving, namely: rectangular starts, polygon starts, and round starts. There are many variants of these types of starts which are related to the design of the product. Some weaving starts are solid, while others are hollow, as show in the pictures below.



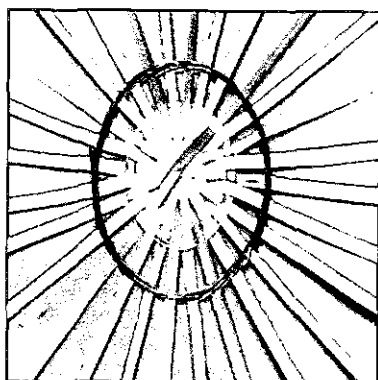
hollow round start



square start



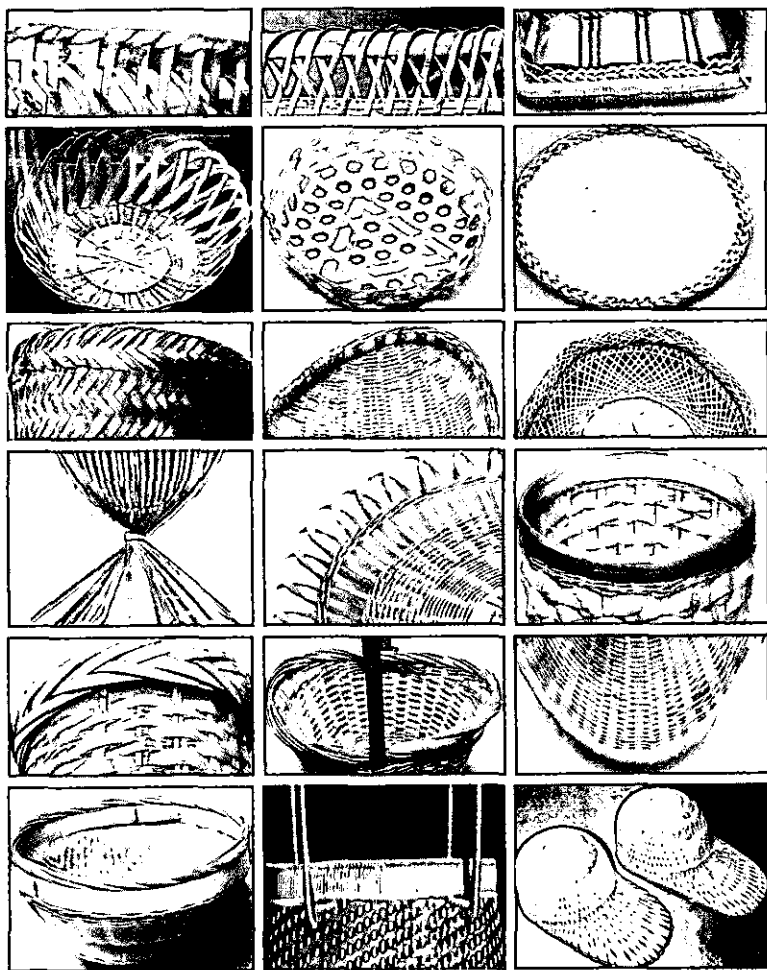
solid round start



elliptical start

B. Finishing

Finishing is a very important step in three dimensional bamboo weaving. There are mainly 5 finishing methods, namely: (1) Wrapping; (2) Locking; (3) Weaving; (4) Tying; and (5) Binding. The pictures below show applications of the various finishing methods in different types of woven products.

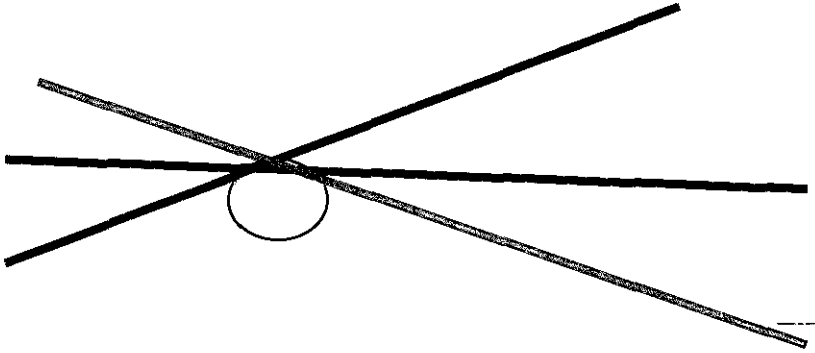


C. Weaving Techniques for Making Bamboo Caps

To make a bamboo cap, a mold of the cap is needed. The mold is usually made of wood. The weaving pattern will follow the shape of the mold.

- The first step in weaving is to make the start.
- 20 bamboo strips with a length of 50 cm long will be needed.
- Make two hollow round starts at the 3/5 position of the strips.

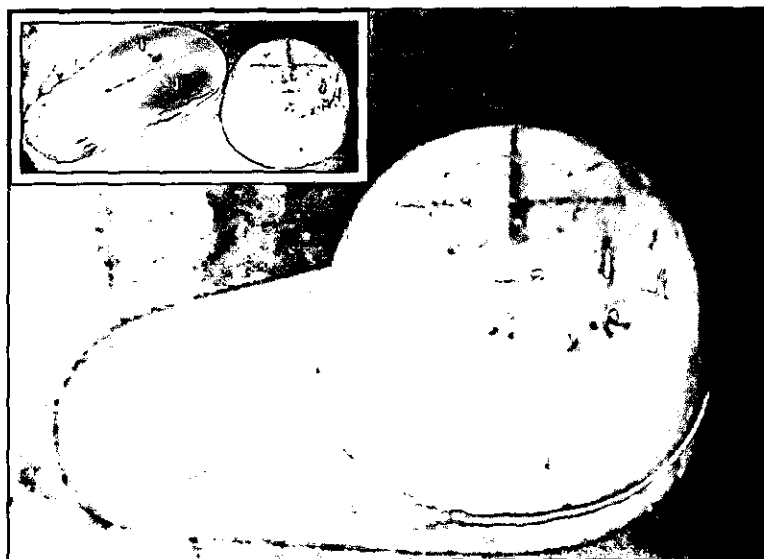
- The initial placing of the strips for the start follows the pattern in the diagram below:



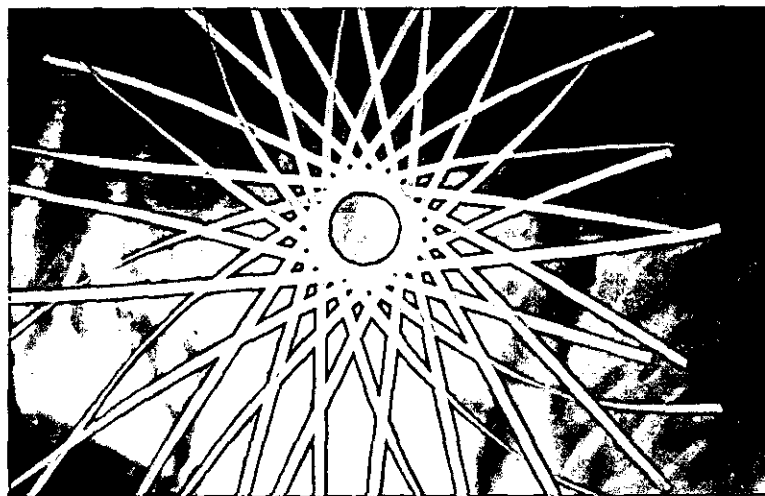
- When the starts are ready, they should be overlapped with each other
- The starts should then be interwoven.
- The overlapping starts should be placed over the mold.
- Weaving should follow the shape of the mold.
- When the shape is completely woven, wrap the edges using long strips.
- Cover the edge with cloth and sew it.

These steps are shown in the following pictures:

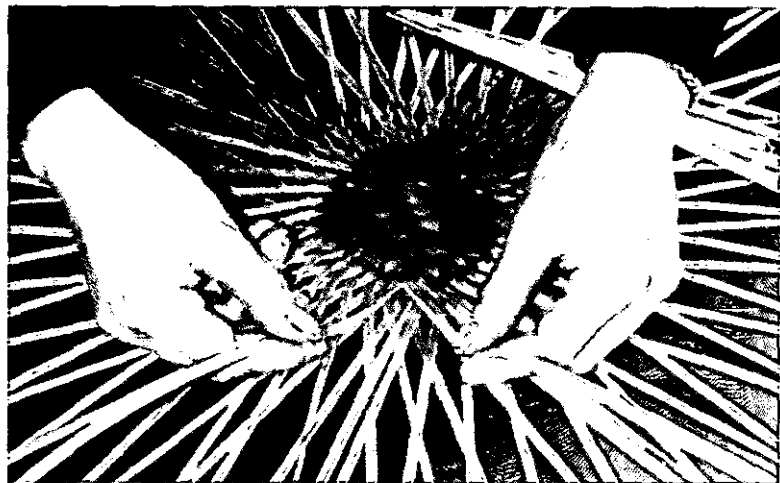
Start by making a wooden mold of the bamboo cap



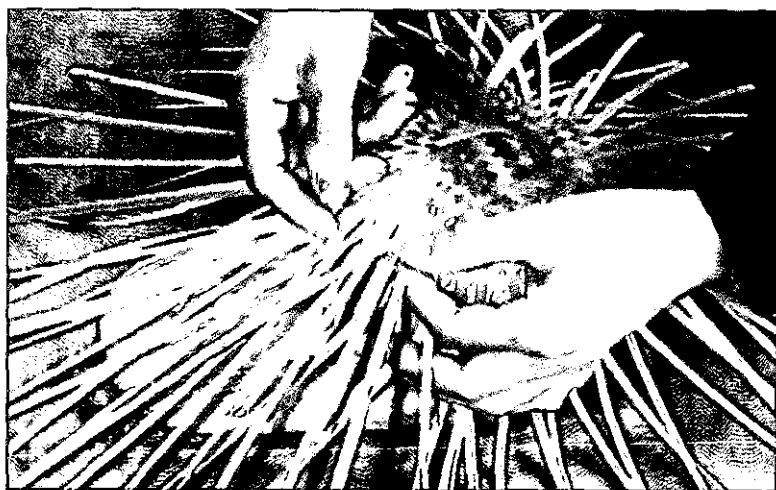
Make two hollow round starts like the one shown below.



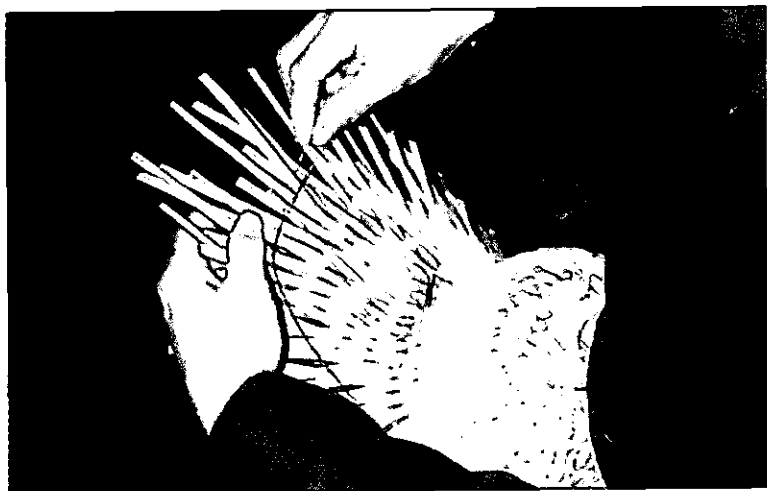
Overlap the 2 round starts and interweave them.



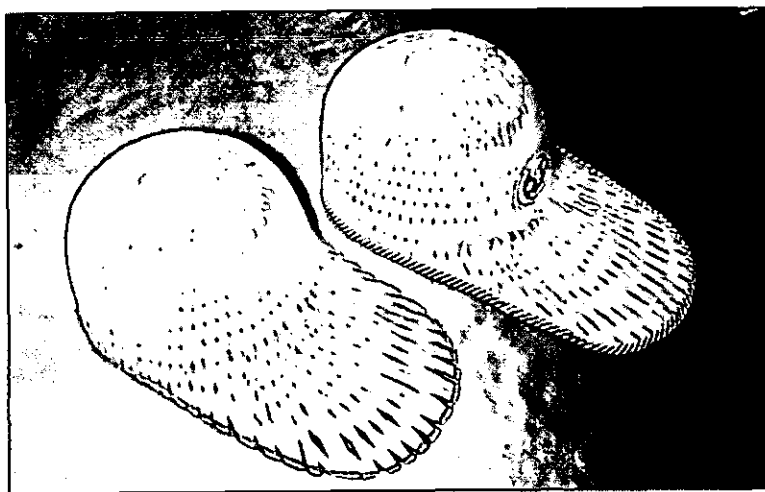
Affix the overlapping start on the mold and weave over the mold.



Wrap the edges with long strips

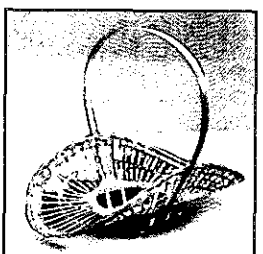
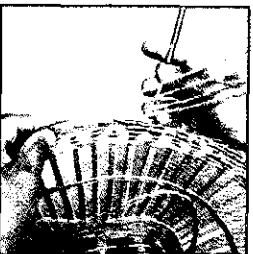
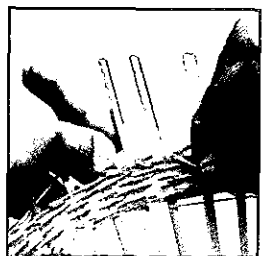
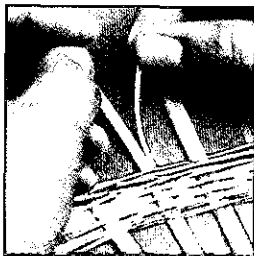
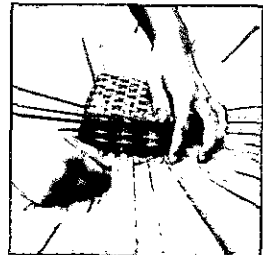
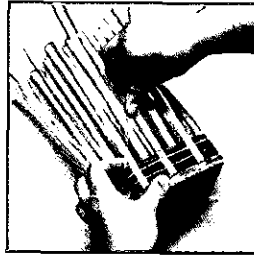
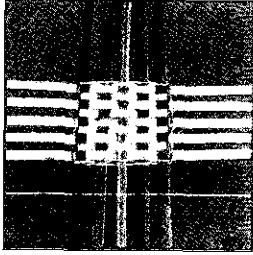


Cover the edge of the cap by sewing cloth over it.



D. Weaving Flower Baskets

There are many styles of bamboo flower baskets. The process of making bamboo flower baskets is demonstrated, from left to right, in the pictures below.

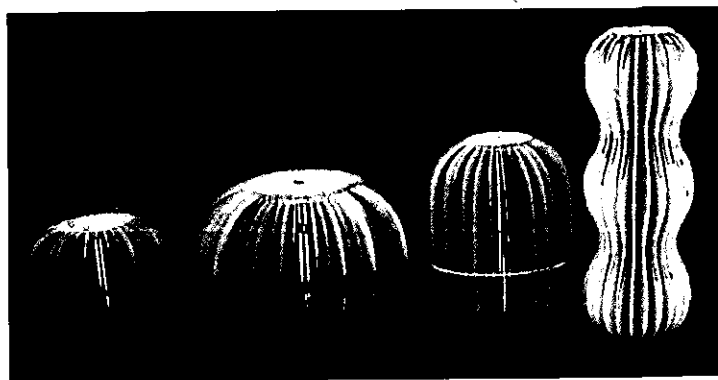


E. Bamboo Lampshade Making

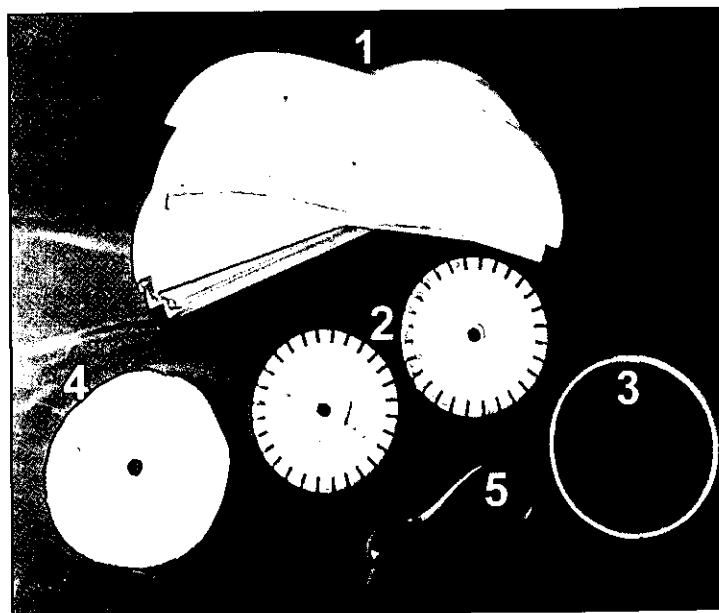
The steps in making bamboo lampshades are described below.

1. The Mold

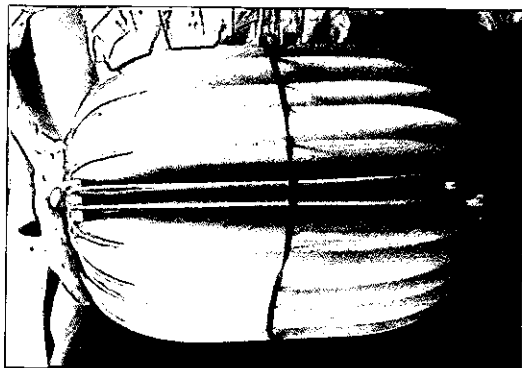
The shape of the lampshade will depend on the mold. There are many different possibilities. Some examples are shown below.



The components of the mold (as shown in the picture below) are: (1) 28 wings; (2) 2 cover boards with 28 grooves each; (3) fastening loop; (4) fastening board; and (5) elastic band.

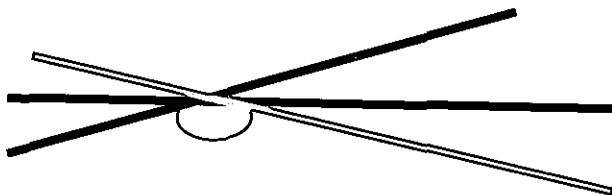


The assembly of the lampshade mold.

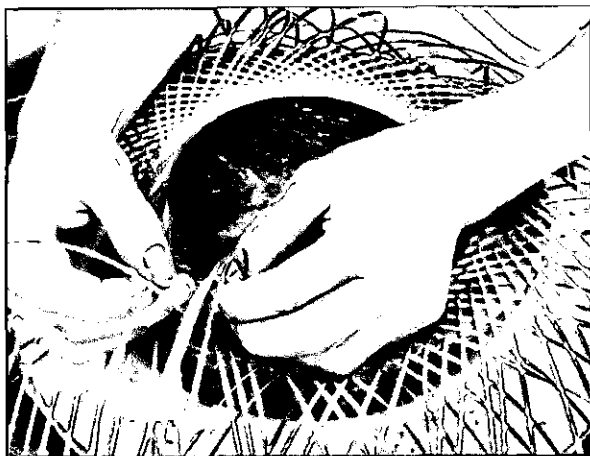


2. The Start

The pattern of the start is illustrated in the diagram and pictures below:

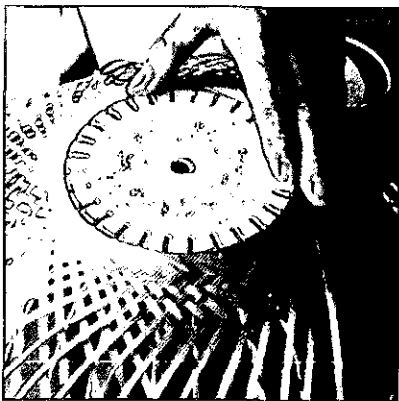


Start of the Woven Bamboo Lampshade

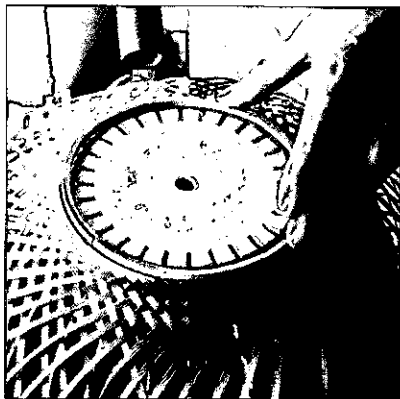


3. Fix the Start on the Mold

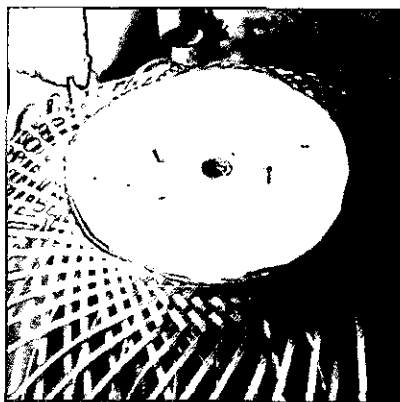
- Put the start on the mould.



- Hold the edge with the fastening loop.

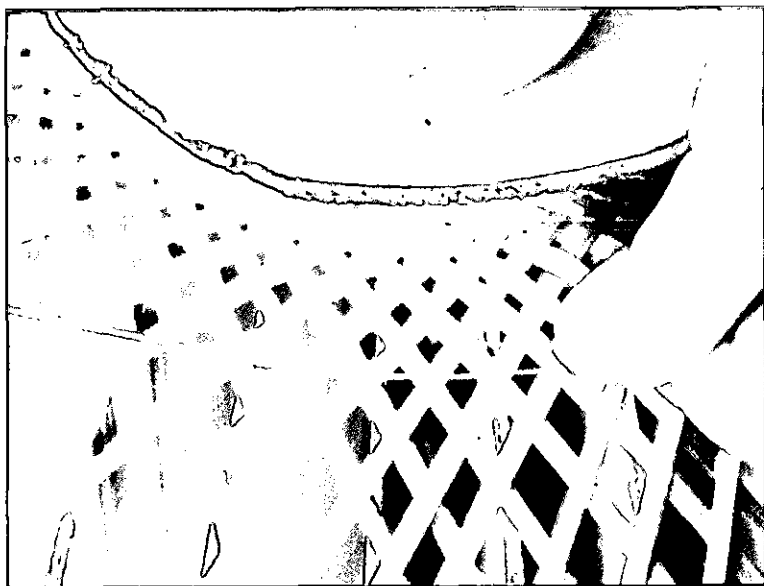


- Fix the fastening board onto the cover board to prevent the start from moving.

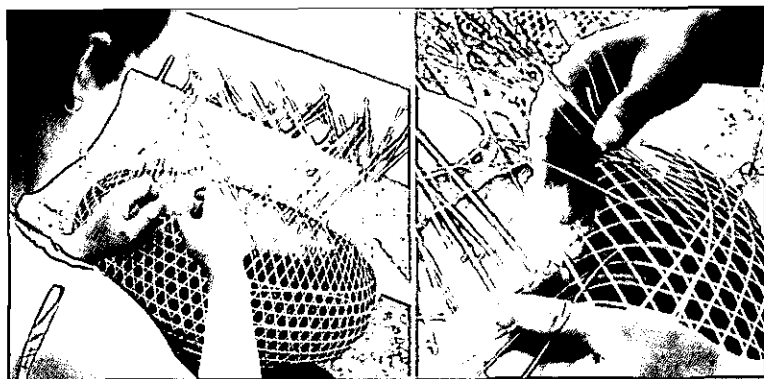


4. Weaving over the Mold

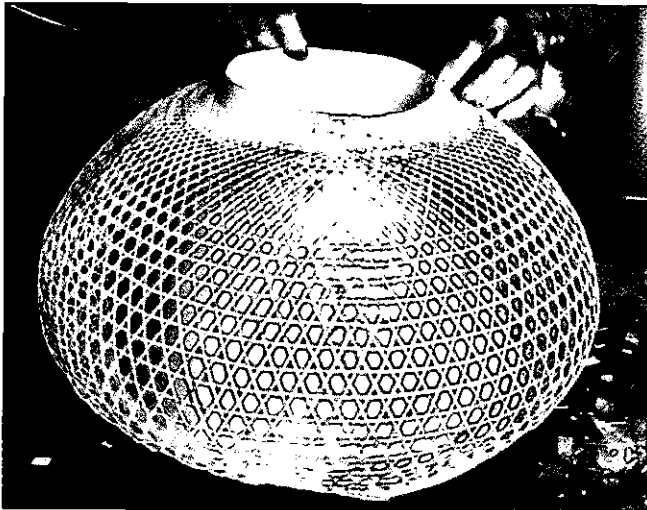
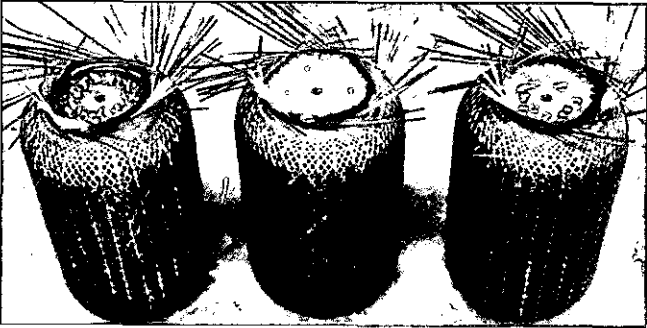
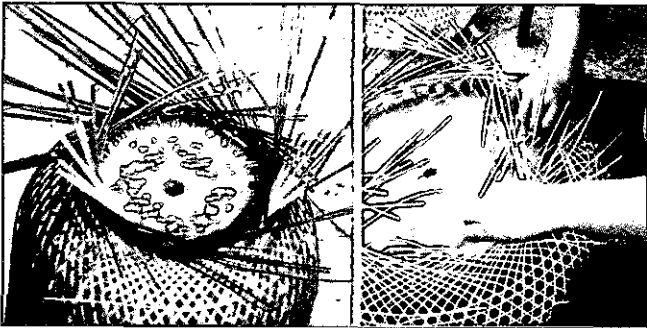
- Insert the first horizontal strip when the holes of the woven pattern start getting larger, as shown below.



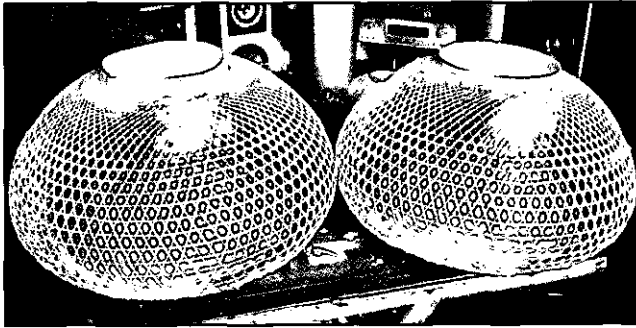
- Weave the body part of the lampshade over the mold.



5. Finishing



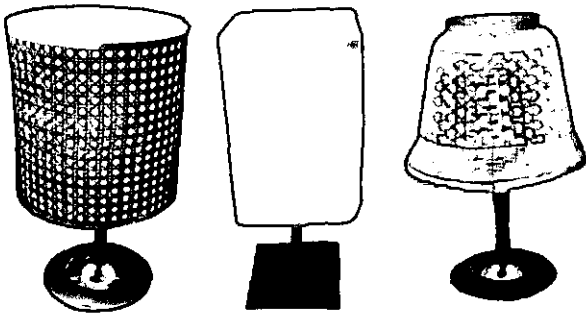
Decorative Lampshade with a Splint



The Finished Products



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