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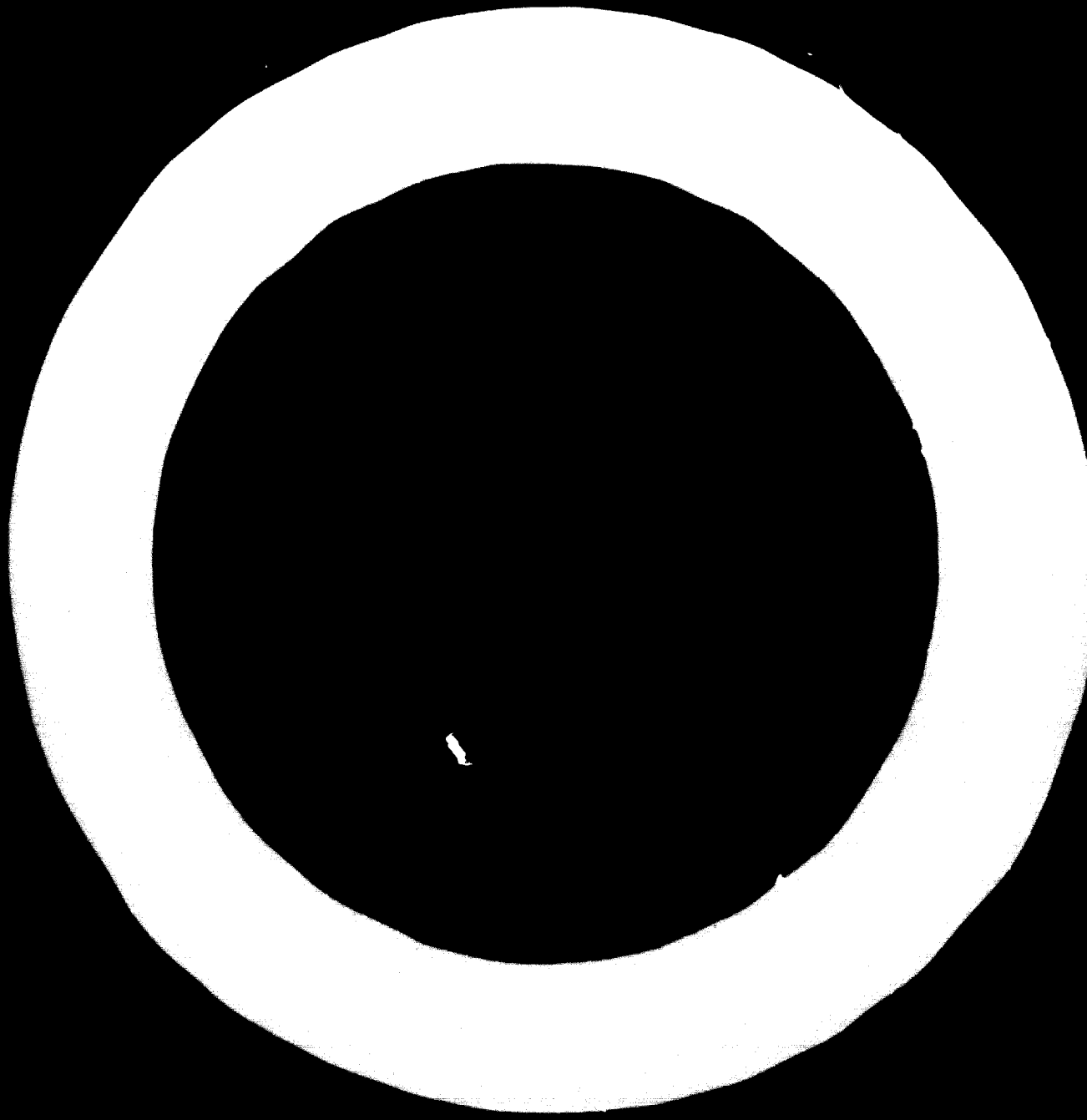
ECONOMICS OF OPEN-END SPINNING IN INDIA ✓

by

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In working out the economics of open-end spinning in India we have considered an installation of 240 automatic looms (40" wide) with other necessary machinery, all working in three shifts. The analysis has been done for four carded counts 10s, 16s, 22s and 28s, woven to typical constructions. In the absence of first hand information on many of the processing aspects, it has been necessary to make certain assumptions. In the main, these are:-

1. The same mixing can be used to spin a given count in both ring and open-end spinning;
2. The processing sequence up to the final drawframe will be identical for both the systems;
3. The end breakage rate at spinning per unit weight of yarn will be slightly greater at open-end spinning. The allocations of spinning heads in break spinning to a tenter have been decided upon on this basis such that the number of piecings done by him in unit time will be of the order 30-50% higher than that by his counterpart in ring spinning. This may be possible because the break spinning tenter will spend less time on cleaning, creeling and patrolling.

Allocations:

| Count | 10s | 16s | 22s | 28s |
|-------|-----|-----|-----|-----|
| R.S.  | 400 | 600 | 800 | 900 |
| O.C.  | 150 | 200 | 300 | 300 |

Spindle Speed in R.S.

| Count | 10s   | 16s    | 22s    | 28s    |
|-------|-------|--------|--------|--------|
| Speed | 8,500 | 10,500 | 11,000 | 12,500 |

4. The rotor speed will be 41,000 r.p.m. as counts up to 22s and 45,000 r.p.m. for 12s. The twist multiplier for open-end spinning will be about 20% higher than for ring spinning. The efficiency of open-end spinning machines will be 90%.
5. Rewinding of open-end spun yarns will not be necessary;
6. The weaving performance with open-end spun yarns will be better resulting in a 5% increase in efficiency on automatic looms (12 looms per weaver) and less damages leading to a 25% higher realisation.

Even with these assumptions there were many imponderables. One important consideration is whether advantage can be taken of the higher bulk of the break spinning yarns to lower the fabric sett for a given cover. This will further reduce the strength of the fabrics but not necessarily their durability, since the abrasion resistance and extensibility of fabrics from open-end spun yarns will be higher. Instead of making arbitrary assumptions on this point we have considered alternate situations - (1) the same mixing can be used for ring and open-end spinning for spinning the same counts and weaving the same fabrics (case 1). With the use of identical mixings it will be possible to reduce the fabric sett by approximately 5% with break spun yarns (case 2).

In considering the advantage of break spinning, only the elimination of speed frames and the higher productivity and large packages in spinning have been included in addition to those mentioned above. Other possible advantages such as less floor space requirements have not been taken into account. Similarly the need for refrigerative cooling of the break spinning shed has been neglected.

The production rates, workloads and wages used in the analysis are those prevalent in the Ahmedabad region. Machine prices and power costs considered here will be valid for the entire country.

In working out the comparative economic merit of ring spinning and open-end spinning, the savings in recurring costs resulting from break spinning have been set against the necessary additional investment. In considering the investment, account has been taken of the concession to which new investments are entitled under the Indian corporate tax structure. The comparison has been made using the present value concept by

which the investment and attachment compensation to redundant labour are converted to series of annual recurring costs at a discount rate of 10% over 10 years which has been assumed to be the machine life.

For each count and the alternative situations discussed above, the 'break-even' price of a single rotor has been worked out. This is the price at which the cost of break spinning is equivalent to that of ring spinning. Thus, for break spinning to be more economical than ring spinning, the actual price per rotor should be lower than those indicated. In the price mentioned here the C.I.F. value quoted by manufacturers has been adjusted to cover the import duty levied by the Government (approximately 50%).

Essentially the same method has been used in projecting the economics to 1977. One major technical assumption made is that rotor speeds of 60,000 r.p.m. will be possible in 1977. This has a number of implications:-

1. The production rates will increase proportional to the speed;
2. The power consumption will increase proportional to speed 2.5.;
3. The end breakage rate per unit time will increase because of increases in both production rates and increase in speed. Allotment of rotors to a tenter will thus go down.

Following increases in the other cost components have been assumed:-

|                                     |     |        |
|-------------------------------------|-----|--------|
| Labour                              | 50% |        |
| Cotton                              | 50% |        |
| Power                               | 25% |        |
| Fabric selling price                |     | } 4.0% |
| Conventional Spinning Machine Price |     |        |

From this analysis, the following conclusions emerge:-

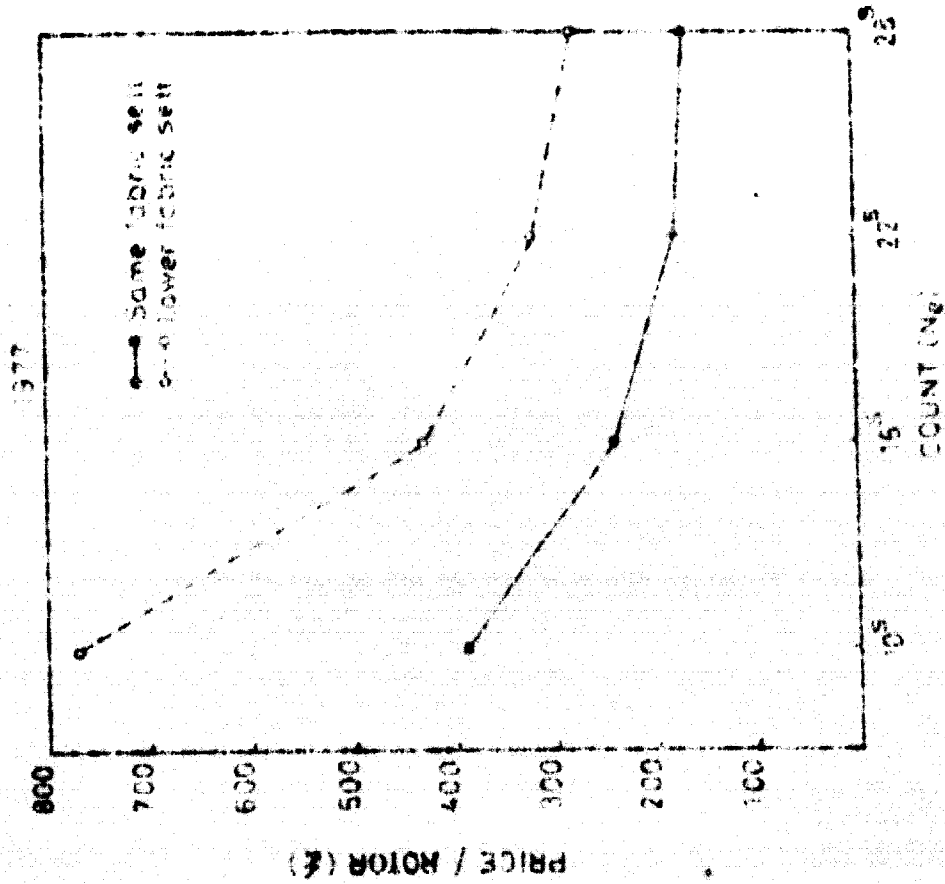
- At present (1) with the same fabric sett, open-end spinning will be economically viable up to 10s count.
- (2) if a lower fabric sett is possible, the economic count limit will be around 14s.

The picture is not likely to change materially in a few years hence.

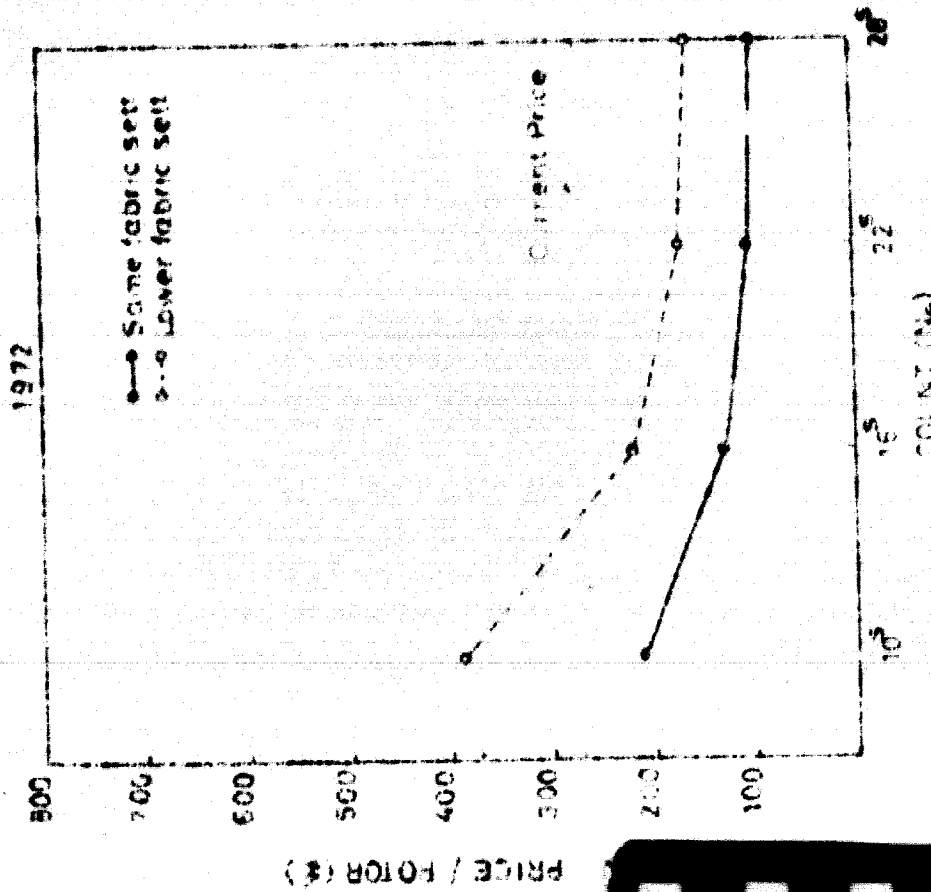
Lastly, if the generally trashy Indian cottons are not suitable for open-end spinning and it becomes necessary to use superior cottons for a given count as compared to ring spinning, the resulting increase in cotton costs will render break spinning uneconomical at all counts considered irrespective of fabric sett.

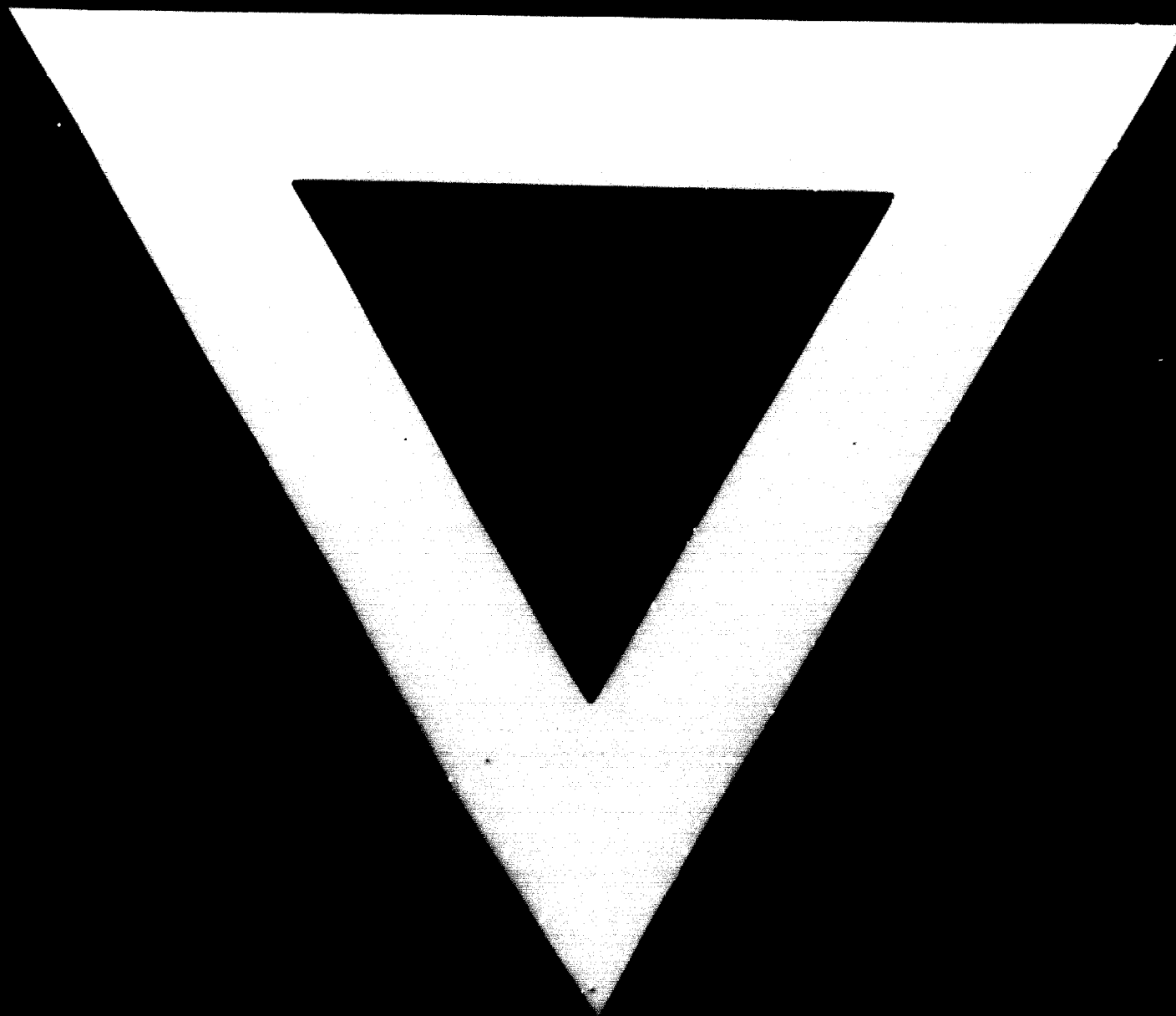


BREAK-EVEN ROTOR PRICES



BREAK-EVEN ROTOR PRICES





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