and can be carried out by semi-skilled labour with limited overall technological supervision.

The basic equipment required consists of : shredder, pressure cooker, beater, hydraulic press, and drying chamber.

With the exception of the last item which can be constructed locally, the other items of the equipment will have to be imported.

The raw materials required in the process are : bagasse, reeds, coconut fibre, and chemicals.

All these materials are easily available in the country.

Pre-Construction Cost Estimation

(Production capacity = 60,000 boards of 8″×4″×1″ per year).

Capital expenditure	Rs.	Rs.
Equipment		3,50,000
Running expenditure (per annum)		
DIRECT EXPENSES		
Raw materials ..	1,01,000	
Direct wages ..	48,000	
Power	15,000	
Contingencies ..	6,000	
Depreciation @ 10% ..	45,700	
		2,15,700
INDIRECT EXPENSES		
Establishment ..	18,360	
Promotion of the project @ 2 1/2% on 5 1/4 lahks (= capital investment)	13,125	
		31,485
Selling expenses		12,600
Interest on capital @ 4% on Rs. 5 1/4 lahks.		21,000
Insurance @ 2 1/2% on Rs. 5,58,000.		13,950
Total cost of production for 60,000 boards		2,94,735

Cost per board = Rs. 4/14/7, say Rs. 5

Cost per sq. ft. = Rs. 0/2/6

FOUNTAIN PEN INKS

The making of writing ink is a very ancient art. The earliest inks consisted of lamp black ground with glue and moulded into sticks which were mixed with water before use. Such inks were used in the early Egyptian and Chinese civilizations as early as 2500 B. C. There are references to iron-gallo ink solutions of an iron salt, usually ferrous sulphate, in extracts of tannin bearing materials dating back to 210 B.C. Prior to the modern era of wide spread manufacture and distribution of goods, the making of writing ink was a household art. The present day writing ink industry, although very old, is relatively small and highly competitive, and the exact composition of the product is the individual manufacturer's secret.

The present annual consumption of fountain pen ink, in Pakistan, which has an upward trend is estimated at 30,000 gal., valued at about Rs. 1,000,000, of which about 50% is imported.

The locally produced inks are, however, of a very poor quality, necessitating the continued import of high quality inks from abroad. The ink produced according to the process developed in the Council's laboratories has been found, to be comparable with the best imported brands.

The total capital investment for a production unit with a capacity of 7000 gallons per year is estimated at Rs. 100,000, and the average cost of one fluid oz. bottle of ink would be 3 annas as against one rupee for a similar quality of imported ink.

Process, Equipment and Raw Materials

The unit processes involved are : preparation of distilled water, preparation of the various solutions, mixing of the solutions, ageing of the ink, centrifuging, filling the bottles, capping the bottles, labelling, and packing.

The equipment required consists of : water distillation plant, agitators, mixers, filters, centrifugal separating machine, mixing tank, air tight storage tanks, filling machine, bottle capping machine, bottle washing machine, labelling machine, and packing machine.

The last four machines are not very essential and can be dispensed with.

The raw-materials required are : dyes, acids, and some chemicals.

Pre-Construction Cost Estimation

(Production capacity = 7000 gallons per year)

Capital expenditure

	Rs.	Rs.
Equipment	28,000	
Building	26,600	
		54,600

Running expenditure (for 6 months)

Raw materials ..	13,800
Direct labour ..	4,980
Establishment ..	6,240

	Rs.	Rs.
Selling expenses ..	2,400	
Packages, power, interest on capital and contingencies	15,000	
		42,420
Total capital investment		97,020
	Say:	100,000

Cost of production of 7000 gals. of ink per year: Rs. 89,855

Average cost of ink: Rs. 13 per gallon.

PATENT NEWS

Abridgements of patent specifications of Pakistani inventors notified as accepted during December 6, 1957 to October 3, 1958 in the Part IV of the Gazette of Pakistan

107598 *Chilam for hubble-bubbles and like smoking appliances.* A.H. KHAN, K. U. KHAN, G. U. KHAN AND M. U. KHAN.—The chilam is provided with an electrically heated coil. A porcelain plate is placed in between the heating coil and the tobacco, above which a disc of earthen ware or stone is placed.

107608 *Keyboard of typewriting machine in Bengali script.* A. A. KHAN.—The keyboard comprises letter-matrices and type-bodies of characters of Bengali for type-writing, teleprinting, monotyping and lino-typing purposes.

107691 *A hand operated injection moulding machine for the manufacture of plastic articles.* HAJI A. A. ZIA.—The machine comprises a vice assembly, die, injection chamber, means for heating the injection chamber, means for forcing the plastic material into the die and means for feeding the plastic material into the injection chamber.

107709 *A process for preserving milk, neera and like perishable liquids.* M. A. KAZMI.—Milk, neera and like perishable liquids are preserved by filling a bottle or like container with the liquid, heating it to a predetermined temperature, closing or sealing it air-tight at that temperature and allowing the bottle or container to cool under air-tight conditions, leaving above the liquid a natural vacuum formed by the contraction of the heat-expanded liquid.

107742 *A mechanical tube well bucket.* S. M. ISMAIL.—The bucket comprises three piston rings, an operating valve, a bucket to raise water from a tube well, a pin, two tube spacers of thin metal round the pin for maintaining in a central position a connecting rod which is attached to the handle of a pump used by hand or by machine. The piston rings operate in the grooves ordinarily to be found in a piston head, as a piston of an ordinary internal combustion engine but in an inverted position.

107743 *A hand driven paddy dehusking machine.* S. M. ISMAIL.—The machine has a receptacle wherefrom paddy is led to a helix and thereon to rotor knives mounted on the main shaft. The friction resulting from rotor knives, an adjustable stripping knife and a perforated semicircular sieve dehusks paddy which falls out.

107744 *Double locking padlocks.* S. M. ISMAIL.—The device relates to a padlock, wherein two ends of a U-shaped hasp or shackle are adapted to be unlocked in succession within the padlock casing, having the locking mechan