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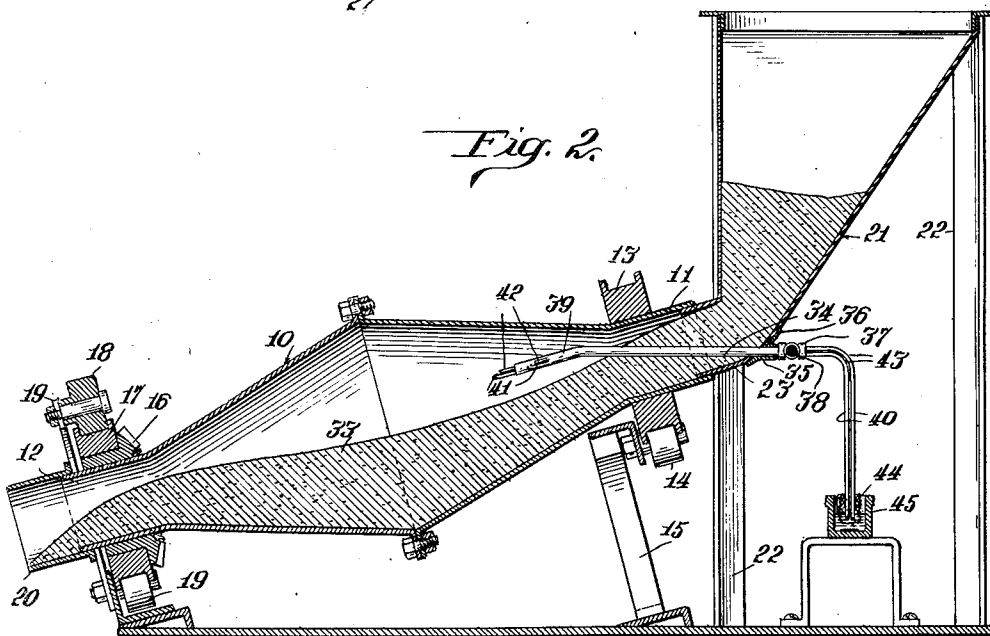
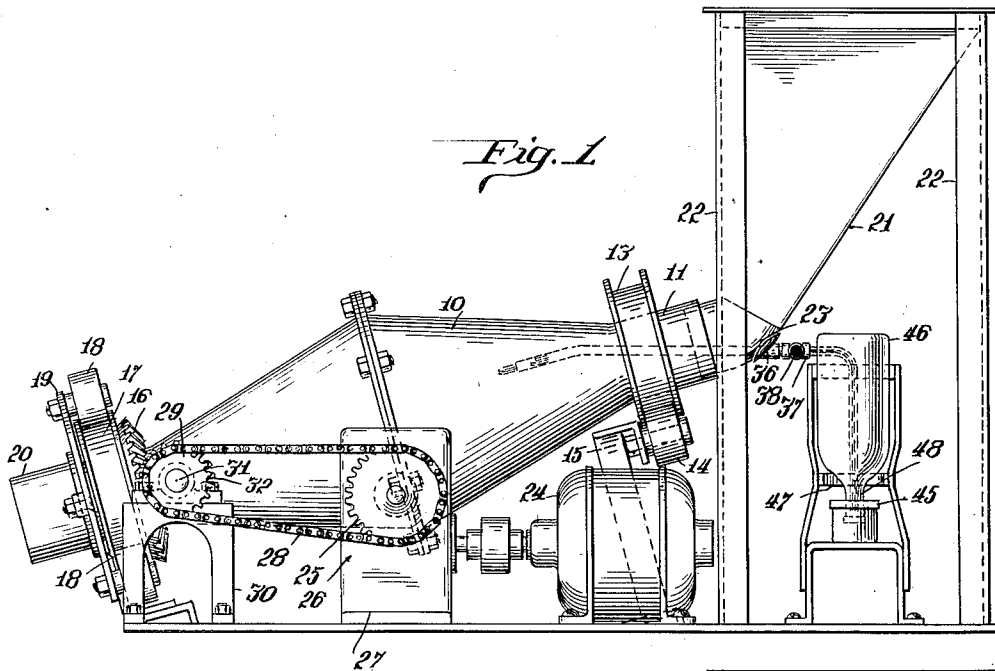
F. L. JEFFERIES

1,928,894

METHOD OF IMPREGNATING MATERIALS WITH A LIQUID

Filed April 22, 1932

3 Sheets-Sheet 1



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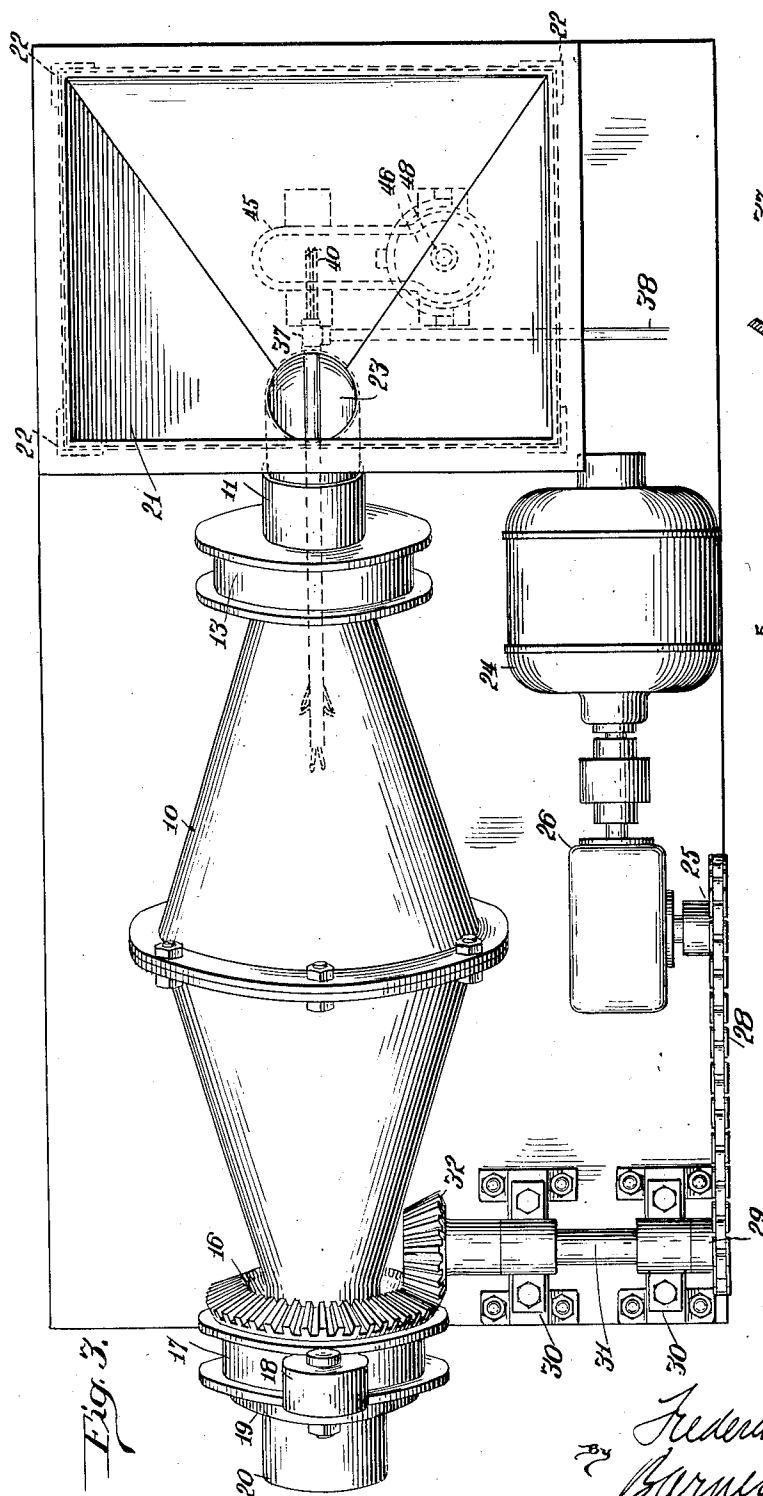


Fig. 3.

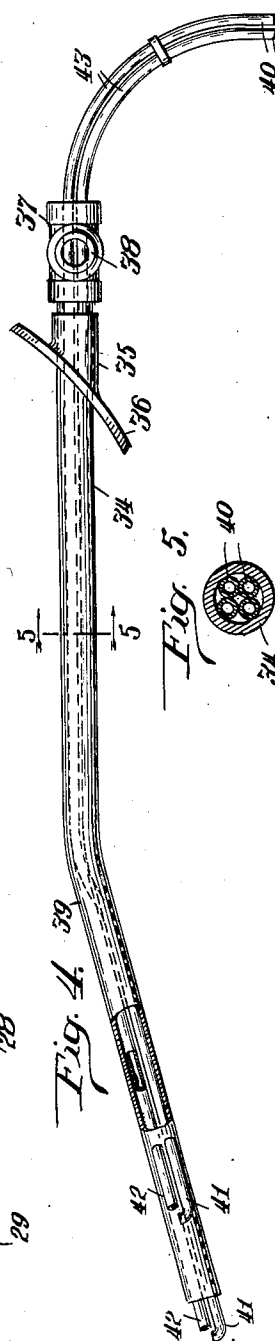


Fig. 4.



Fig. 5.

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Fig. 7.

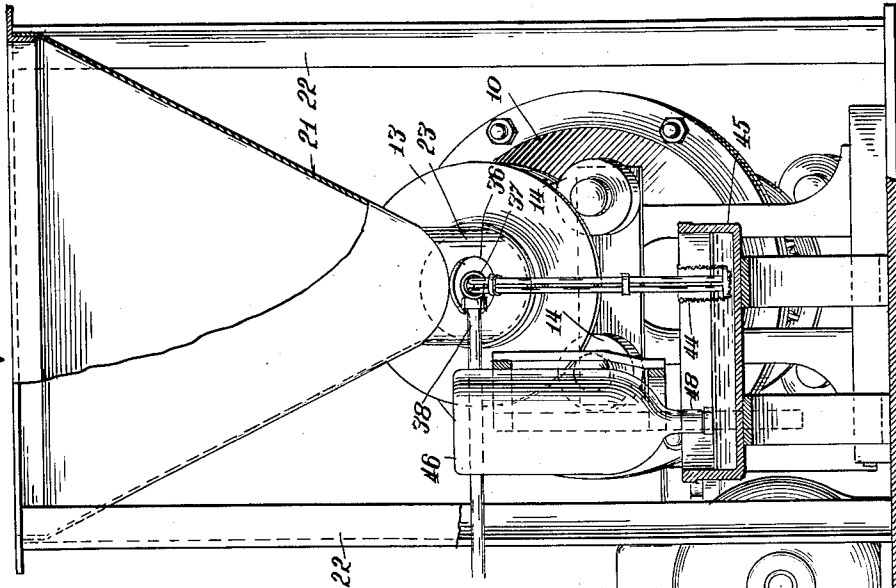
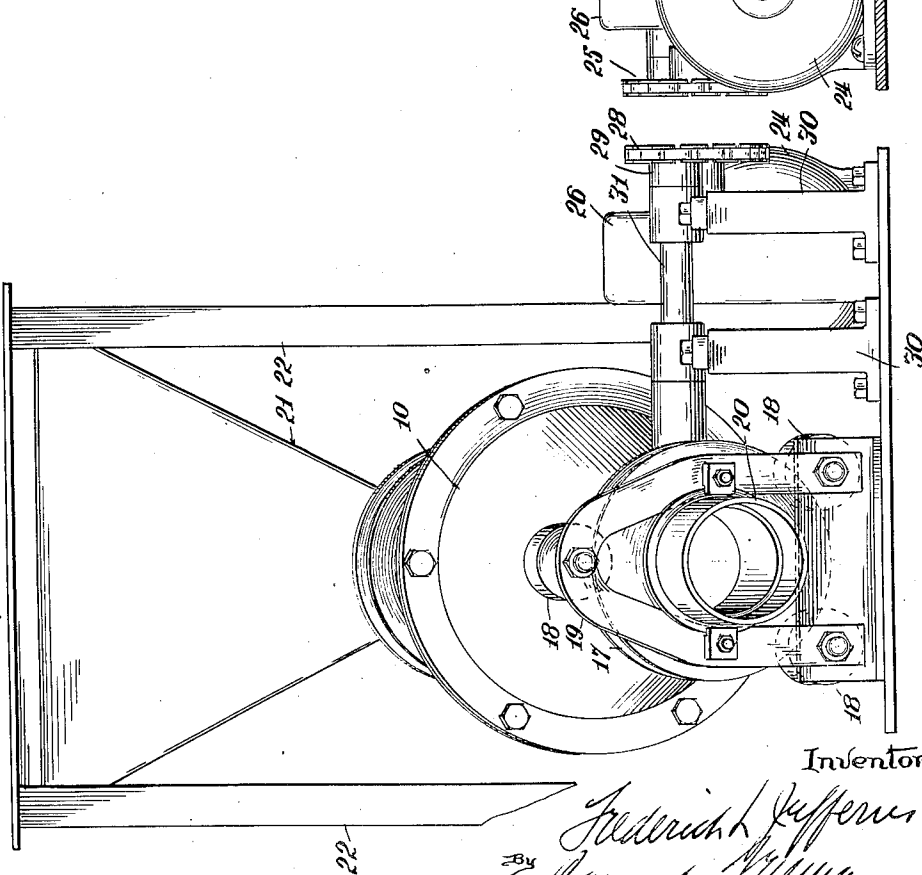


Fig. 6.



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UNITED STATES PATENT OFFICE

1,928,894

METHOD OF IMPREGNATING MATERIALS
WITH A LIQUIDFrederick L. Jefferies, La Grange, Ill., assignor to
International Patents Development Company,
Wilmington, Del., a corporation of Delaware

Application April 22, 1932. Serial No. 606,898

1 Claim. (Cl. 127—71)

This invention relates to the impregnation with a liquid of material consisting of easily breakable crystals, lumps or pieces, for example to the perfuming of starch in crystal or lump form; and the primary objects of the invention are to provide a new and improved method of effectively and economically accomplishing this result without undue breakage or pulverization of the lumps, which are of a brittle, friable and crumbly character, and also without formation of any substantial amount of paste through the wetting of the starch dust which the product contains, or which may be developed, to some extent, in the process of impregnation with the perfume.

The invention is illustrated in the accompanying drawings which show a novel and improved apparatus suitable for carrying out the novel and improved method of the invention. In the drawings:

Fig. 1 is a side elevation of the apparatus.

Fig. 2 is a longitudinal section view thereof.

Fig. 3 is a plan view, on a larger scale than the preceding figures.

Fig. 4 is a detailed view and side elevation, with parts in section, of the atomizing device.

Fig. 5 is a cross section on line 5—5 of Fig. 4.

Fig. 6 is a view in elevation of the apparatus looking from the lower or discharge end of the drum; and

Fig. 7 is a view in elevation, with certain parts in section, of the other end of the apparatus.

Referring to the drawings: 10 designates a revolvable drum which is of maximum diameter at the middle and tapers toward its ends, which terminate in cylindrical portions 11 and 12, a drum of this shape being conveniently referred to as a double-cone drum. The drum is arranged with its axis inclined. The upper annular end portion 11 is provided with a channelled bearing ring 13 for rollers 14, 14, journaled on a supporting member 15. Secured to the lower annular member 12 is a bevelled gear 16, and surrounding and secured to the bevelled gear is a bearing member 17 for rollers 18, 18, 18, journaled on a support member 19 on which is arranged a discharge spout 20 into which the annular portion 12 of the drum projects.

21 is a hopper carried on a framework 22, the hopper terminating in a curved spout 23 which projects into the annular member 11 on the upper end of the drum.

The drum is rotated by a motor 24 which drives a sprocket 25, through the inter-position of a speed-reducer 26, the sprocket being mounted on

a standard 27 and driving a link belt 28 which extends around a sprocket 29 on a supporting member 30 in which is journaled the shaft 31 of the sprocket wheel 29 which shaft on its inner end carries a bevelled gear 32 meshing with the bevelled gear 16 on the lower end of the drum.

The impregnating liquid is introduced into the drum preferably above the material 33 (Fig. 2) by an atomizing device constructed preferably as follows: 34 is a pipe which extends through a fitting 35 having a curved plate 36 for attachment to the spout 23 of hopper 21, the spout being formed with an opening for the pipe 34 at this place. Pipe 34 is provided at its outer end with a T-fitting 37 for an air-pipe 38 which may be connected with an air compressor (not shown). The inner end of pipe 34 is preferably bent down as indicated at 39 (Fig. 2). A plurality of small tubes, for example four such tubes designated 40, extend through the pipe 34 and terminate in curved nozzles 41 which project out of pipe 34. The pipe 34 is provided with air-nozzles 42 (Fig. 4) arranged to direct air over the bent ends of the nozzles 41. The other ends of the tubes 40 are bent over at 43 and extend into a strainer 44 arranged in a vessel 45. A bottle 46 containing the perfuming liquid is arranged in inverted position on a support 47, with its neck 48 projecting into the vessel 45. It will be understood that the tubes 40 and their nozzles are sealed into the air-pipe 34 which is open only at its nozzles 42. When air is forced into pipe 34 from pipe 38, the liquid is drawn up through the tubes 40 and injected from their nozzles 41 in atomized condition.

The material is preferably fed through the drum 10 at such rate that the charging end of the drum is closed by the material so as to prevent the escape of the atomized perfume. The inner surface of the drum is highly polished, and the drum is revolved at such a speed, for example at 24 revolutions per minute, that there is substantially no lateral displacement or tumbling of the starch crystals on themselves. That is, the material flows through the drum in a ribbon, the drum rotating under the material, so to speak, without turning it over on itself. In this way the breakage of the crystals or lumps, which are quite friable and brittle, is reduced to a minimum. There is also very little pulverization of the lumps. The material as a mass is porous so that the volatile perfuming liquid readily penetrates through all parts of the material. This complete impregnation of the material is facilitated by the wiping action of the drum on the

	under side of the moving ribbon of material. That is, some of the perfume wets the inner surface of the drum, and this very thin film of liquid is immediately wiped off on the starch particles. The action is such as to prevent any appreciable formation of paste through wetting of the starch dust which may be in the material or may be developed by the movement of material through the drum.	terial consisting of easily breakable crystals or crystal-like pieces, such as starch lumps, which consists in feeding the material through a hollow drum having a smooth inner surface, injecting the liquid in an atomized state into the drum above the material and rotating the drum under the stream of material without substantial transverse displacement or tumbling of the material on itself.	80
10	I claim: Method of impregnating with a liquid a ma-	FREDERICK L. JEFFERIES.	85
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