Oct. 8, 1935. A. E. COLLINS 2,016,316

METHOD OF AND APPARATUS FOR APPLYING A COATING TO ARTICLES

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Fig-1

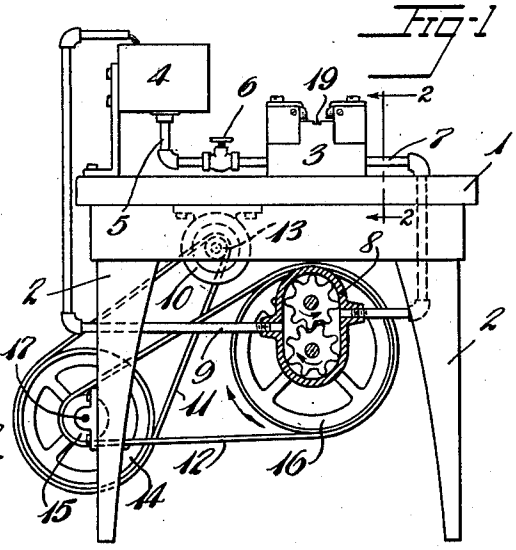


Fig-5

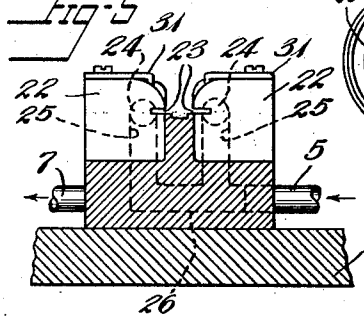


Fig-2

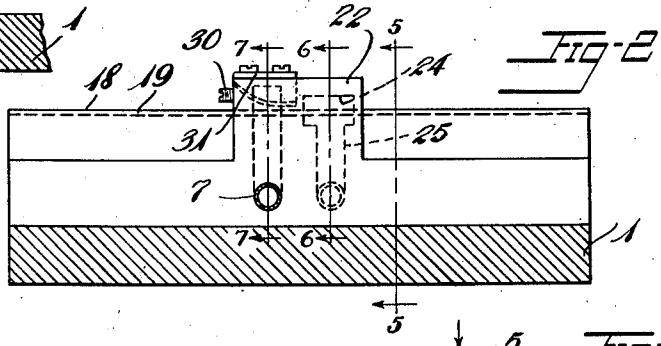


Fig-3

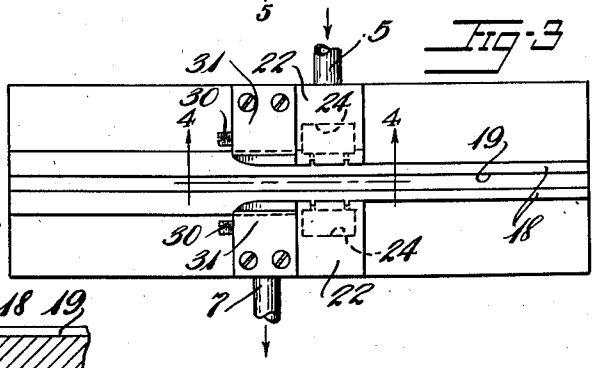
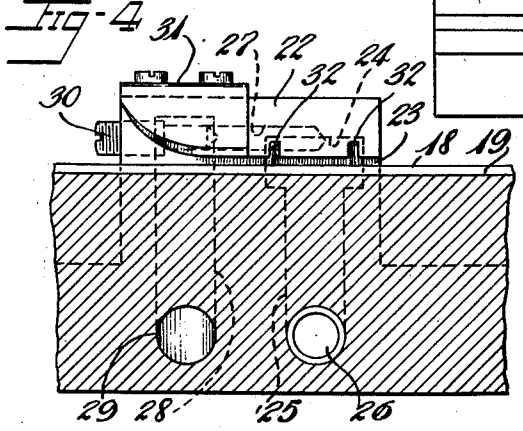


Fig-4



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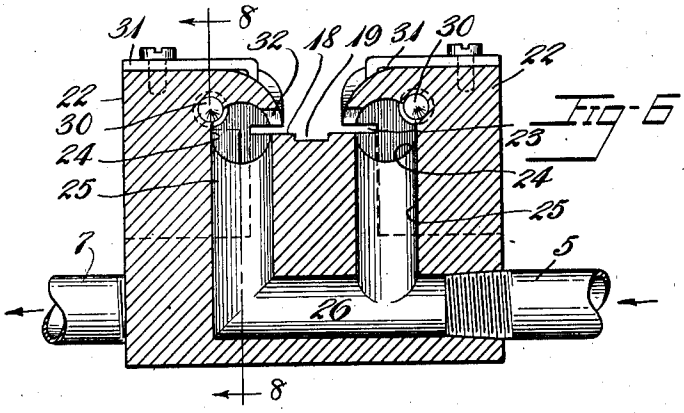


Fig-6

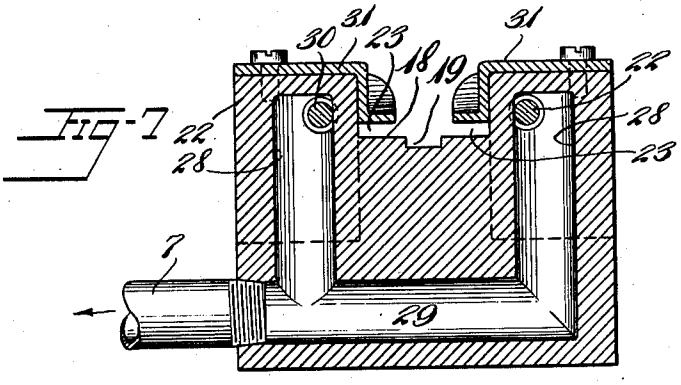


Fig-7

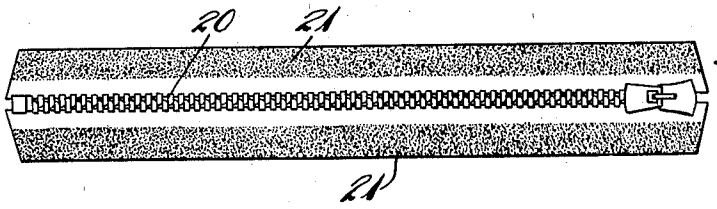


Fig-8

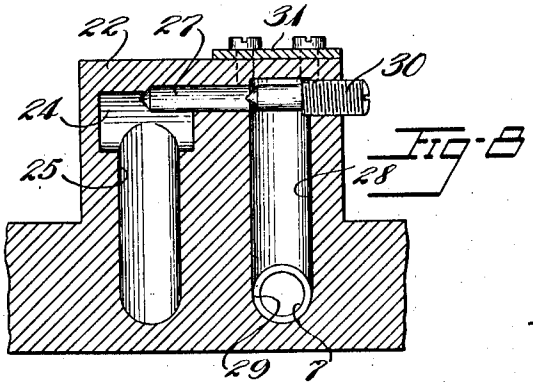


Fig-8

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UNITED STATES PATENT OFFICE

2,016,316

METHOD OF AND APPARATUS FOR APPLYING A COATING TO ARTICLES

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Application February 4, 1932, Serial No. 590,804

8 Claims. (Cl. 91—18)

This invention relates to a method of and apparatus for applying a coating to articles and is especially useful in applying an adhesive coating to the margins of an article.

The principal objects of this invention are to conserve the supply of coating material, to insure accurate deposit thereof on the article, and to attain efficiency in operation.

Other objects will appear from the following description and the accompanying drawings.

In the drawings:

Fig. 1 is a side elevation of the apparatus as constructed to apply coatings of rubber to the stringers of slide fastener devices.

Fig. 2 is an enlarged view of the applicator taken on line 2—2 of Fig. 1, the table being shown in section.

Fig. 3 is a plan view of the applicator, the connecting pipes being broken away.

Fig. 4 is a fragmentary section of the applicator taken on line 4—4 of Fig. 3.

Fig. 5 is a cross section of the applicator taken on line 5—5 of Fig. 2, the pipes being broken away.

Fig. 6 is a cross-section taken on line 6—6 of Fig. 2, the pipes being broken away.

Fig. 7 is a cross-section taken on line 7—7 of Fig. 2, the outlet pipe being broken away.

Fig. 8 is a fragmentary section on line 8—8 of Fig. 6.

Fig. 9 is a plan view of a slide fastener showing the coating applied to the margins of the stringers.

Referring to the drawings, the numeral 1 designates a table top supported by legs 2. The applicator 3 is mounted on the table top which also supports a tank 4 to contain a supply of coating material such as rubber cement. A pipe 5 is provided for conducting the coating material to the applicator and is intercepted by a valve 6, the arrangement being such that the tank 4 is above the applicator 3 and the coating material may flow to the applicator except when valve 6 is closed.

A return pipe 7 connects the applicator to a pump 8, preferably of the gear type, and a pipe 9 delivers the coating from the pump to the tank 4. The gear pump is rotated in the direction indicated by the arrow by an electric motor 10 through suitable speed reducing mechanism such as belts 11 and 12, and pulleys 13, 14, 15 and 16, pulleys 14 and 15 being mounted on a countershaft 17.

The applicator comprises a block formed with a supporting surface 18 having a groove 19 therein to guide the fastener elements 20 of a slide fastener while the stringers 21 thereof are supported by the surface 18. Midway of the surface 18 a pair of opposite coating members 22 extend above the surface 18 and are formed with longitudinal slots 23, 23 having their lower sides at the same level with the surface 18 and providing passages through which the stringers 21 may pass. The slots 23, 23 are adapted to be substantially closed by the slide fastener stringer tapes 21 so that cement is sucked into the chambers 24 when stringer tapes are in the slots but above the slots 23 the walls of the coating members are notched as at 32 to provide additional air passages to chambers 24 for admitting a moderate amount of air to the chambers 24 and thus avoiding suction of an excessive amount of cement into the chambers when the slots 23 are occupied by the stringer tapes.

Each of the members 22 is formed with a coating chamber 24 which is in communication with its slot 23. The surface 18, of which the floors of the end portions of the slots 23 are horizontal continuations, is at an altitude midway of the chambers 24. The coating chambers 24 communicate with inlet pipe 5 by respective passages 25, 25 and a trunk passage 26 and with pipe 7 by respective passages 27—28, 27—28, and a trunk passage 29, the flow of the cement through the chambers 24, 24 being in a direction opposite to that of the movement of the slide fastener. Needle valves 30, 30 adjustably control the out-flow of cement through passages 27—28, 27—28. Guides 31 are provided to align the stringers 21 with the slots 23.

The operation of the device is as follows: Tank 4 is filled with rubber cement or other coating composition. The motor is started to operate the pump and valve 6 is then opened. The coating material flows through pipe 5 and fills passages 26 and 25 and the chambers 24 to about the level of the slots 23, air freely entering the chambers 24 through the notches 32 and also through the slots 23 until the latter are closed by the stringer tapes. Atmospheric air entering slots 23 and 32 prevents the escape of coating fluid, the needle valve 30 being adjusted to suit the nature of the coating material, and the coating material is drawn past needle valve 30 through passages 28 and 29 and pipe 7 by the pump 8 and is delivered back to tank 4. A slide fastener such as that shown in Fig. 9 is then laid on surface 18 with its fastener elements 20 in groove 19 and in this position is passed along the applicator. The projecting margins of the stringer 21 pass through slots 23 where they contact with the coating ma-

terial only to their extent within the slots, the coating being indicated in Fig. 9 by the stippled surface, and the surface shown without stippling remaining uncoated. As the stringers practically close the slots **23** during the coating operation, this causes the pump temporarily to draw more strongly upon the cement supply, so that both sides of each stringer margin are coated, but the slots **32** allow air to enter above the stringers to prevent excessive drawing of coating material into the chambers **24**.

When the slide fastened has been drawn entirely through the device, so that the slots **23** are again open, the suction of the pump upon the cement supply is thereby lessened, and the rapid flow of air through the slots **23** prevents outward flow of cement therethrough.

As the coating composition is almost completely enclosed, evaporation of the solvent is comparatively slow. The constant circulation of the coating keeps the consistency thereof uniform.

While the invention is especially useful in coating slide fasteners, it is readily apparent that it is equally useful wherever the margins of sheet material are to be coated with a liquid, and while, in the device illustrated, simultaneous application of two margins is shown, it is apparent that coating of a single margin may be accomplished by providing only one coating chamber or by closing one of the needle valves.

I claim:

1. Apparatus for applying a fluid to an article, said apparatus comprising a chamber formed with an aperture adapted to be at least partly closed by the article, a source of coating material in communication with said chamber, and suction means in communication with said chamber producing a suction at the aperture controllable by the article in its relation to the aperture.

2. Apparatus for applying a coating to the margin of an article, said apparatus comprising a chamber formed with an aperture adapted to enclose a portion of the margin of the article, a fluid supply tank connected thereto, and a pump for withdrawing fluid from said chamber at a sub-atmospheric pressure to produce a suction inwardly through said aperture.

3. Apparatus for simultaneously applying a coating to a plurality of margins of an article, said apparatus comprising a plurality of chambers each formed with an aperture adapted to enclose a portion of a margin of the article as the article is moved therethrough, means for guiding the article therethrough, and means for providing a flow of coating material through said chambers at a pressure not exceeding the atmospheric pressure.

4. The method of simultaneously coating a plurality of margins of an article, said method comprising moving the article so that its margins simultaneously and progressively occupy open slots in a plurality of coating chambers, and maintaining a flow of coating material through the chambers at a pressure not exceeding that of the surrounding atmosphere so that the material will not flow outwardly through the slots in the absence of the article but contacts the article when the latter occupies the slots.

5. The method of applying a coating to an article which comprises producing a suction in an apertured coating chamber to prevent egress of the coating material through the aperture, and disposing the article to be coated to at least partially close the aperture thereby at least partially reducing the suction through the aperture to permit the coating material to contact the article.

6. Apparatus for applying a coating to an article, said apparatus comprising a chamber open to the atmosphere and adapted to receive the article at its opening, and means including a pump having its suction end connected to the chamber for providing a flow of coating material through the chamber at such pressure not exceeding that of the surrounding atmosphere that the material does not flow outwardly through the opening in the absence of the article but contacts the article automatically when the article is positioned to substantially close the opening.

7. The method of applying a coating to an article which comprises positioning the article at the opening of an open coating chamber while producing by exhaustion of the chamber a flow of coating material through the chamber at such pressure not exceeding atmospheric that the material does not flow outwardly through the opening in the absence of the article but contacts the article automatically when the article is positioned to substantially close the opening.

8. The method of applying a coating to the margin of an article, said method comprising moving the article so that its margin progressively occupies an open slot in the coating chamber, and maintaining, by suction applied to said chamber, a flow of coating material through the chamber and such pressure not exceeding that of the surrounding atmosphere that the material does not flow outwardly through the slot in the absence of the article but contacts with and coats the article automatically when the latter is moved through the slot.

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