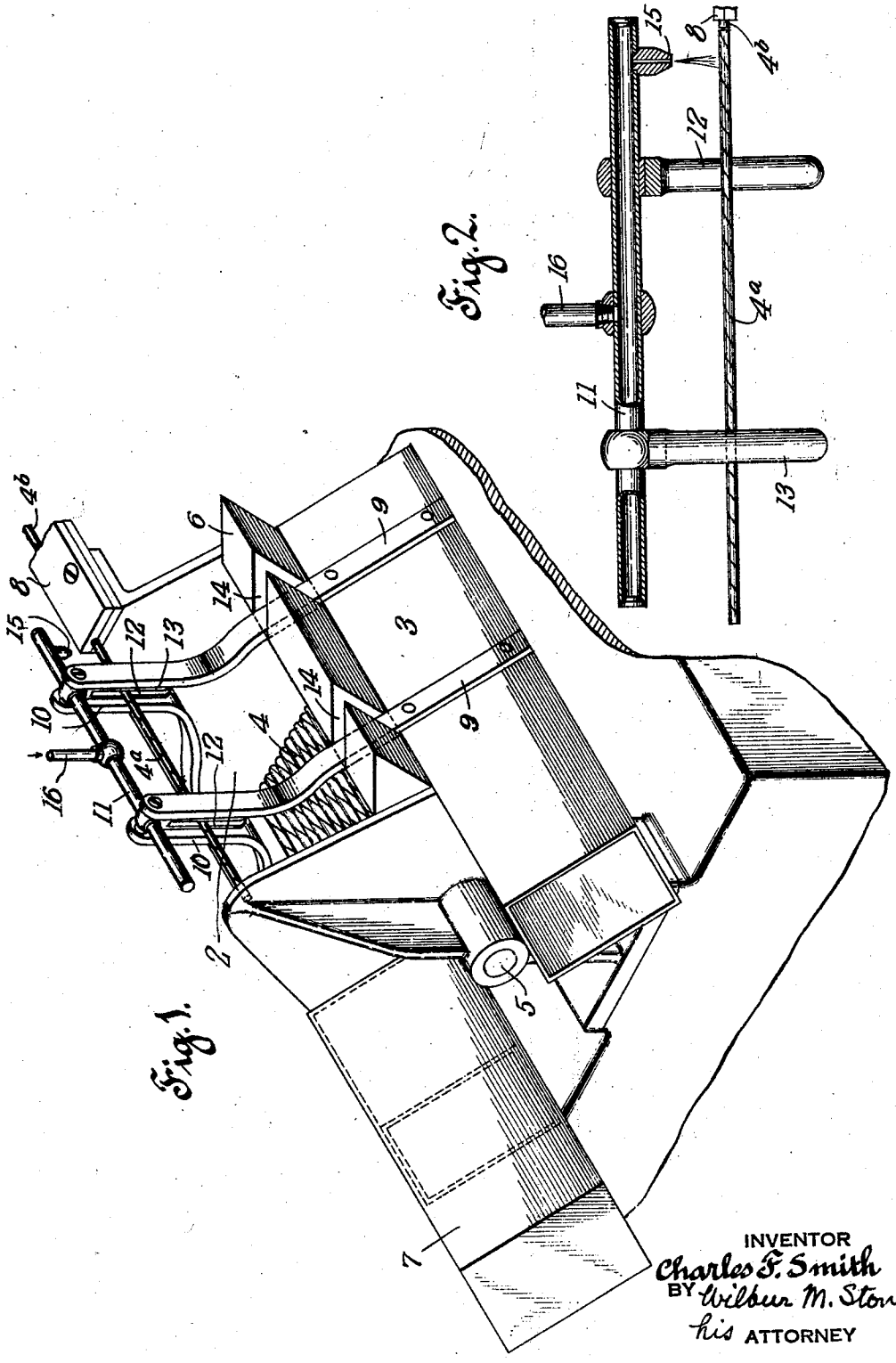
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DELIVERY MECHANISM FOR PAPER TUBES

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UNITED STATES PATENT OFFICE

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DELIVERY MECHANISM FOR PAPER TUBES

Application filed September 25, 1928. Serial No. 308,263.

This invention relates to delivery mechanism for paper tubes and has for its object to provide a device of the character specified, simple in construction and dependable and accurate in operation.

To these ends my improved mechanism comprises features illustrated in their preferred embodiment in the drawing accompanying this specification wherein Figure 1 is a perspective view of so much of a paper tube delivery and packing machine as will suffice to show the application of my improvements thereto. Figure 2 is an elevation, partly in section, of the principal features of my improved mechanism. The scale of Figure 2 is about twice that of Figure 1.

The present invention is in the nature of improvements on the invention disclosed in my copending application, Serial Number 148,131 filed November 13, 1926, for improvements in machines for packaging paper tubes, to which reference may be had.

In Figure 1 of the drawing in this present case, opposite hoppers 2, 3, are provided for the reception of paper tubes, as 4, 4 cut into uniform lengths. Hinged on shaft 5 between said hoppers is gate 6, which, as shown in said figure, closes hopper 3 while acting as a side wall for hopper 2. When said gate is swung backward to the left, hopper 2 is closed thereby and hopper 3 is opened for the reception of tubes. The contents of hopper 2 is then ejected by means not shown, but shown in said copending application, into carton 7 slipped over the protruding end of hopper 2.

In view of the high speed at which the tubes are delivered from the tube forming machine to the packaging machine and in view of the practically continuous succession of those tubes from delivery guide 8 to above the entrance to the hoppers, I have found, due to the very light weight of each individual tube as 4^a that said tube often has insufficient time in which to fall out of the path of the next succeeding tube as 4^b, before tube 4^b emerges from guide 8. This often causes the leading end of the tube 4^b to impinge upon the retreating end of tube 4^a whereby said tube 4^a is hindered and prevented from falling promptly into the hopper therebelow. The orderly arrangement of the tubes 4 in the hopper is thereby deranged.

To obviate this objectionable feature I have provided arms 9, 9 upreaching from hopper 3 and similar arms 10, 10 upreaching from hopper 2. Gate 6 is slotted at 14, 14 so as not to interfere with said arms. Between the upper ends of these arms respectively is mounted pipe 11, preferably closed at both ends and having depending therefrom one or more pairs of opposite down-reaching fingers as 12, 13 which are located on either side of the path of the tube from guide 8. Near that end of pipe 11, slightly beyond the point of emergence of the tubes from guide 8 is downwardly pointing nozzle 15, directly above the path of the tubes from said guide. At some convenient location air delivery nipple 16 is connected with pipe 11.

From some known source of supply not shown, air under slight pressure is delivered through nipple 16, pipe 11 and from nozzle 15 against tube 4^a, whereby said tube is urged downwardly into the hopper thereunder, its descent being guided by fingers 12, 13, so that for some distance during the early part of its descent it is constrained to remain within the influence of the blast of air from nozzle 15.

Preferably said blast of air is delivered from nozzle 15 intermittently and coincident with the emergence of the rear end of any given tube from guide 8 so that only the rear end of the tube is influenced by said blast. This urges said rear end of the tube downwardly out of the path of the outcoming succeeding tube 4^b, permitting said tube 4^b a free entry over the hopper. By this means the tubes are delivered to the hopper below in orderly arrangement and may be conveniently ejected as a mass into the awaiting carton 7.

I claim:

1. In a delivery mechanism for tubes the combination of a hopper, a tube delivery guide contiguous to one end of said hopper, a downwardly pointing air delivery nozzle above the path of the tubes from said guide, and means for guiding tubes downwardly into said hopper.

2. In a delivery mechanism for tubes the

combination of a hopper, a tube delivery guide contiguous to one end of said hopper, a downwardly pointing air delivery nozzle above the path of the tubes from said guide, said nozzle being near the delivery end of said delivery guide, and means for guiding tubes downwardly into said hopper.

3. In a delivery mechanism for tubes the combination of a hopper, a tube delivery guide contiguous to one end of said hopper, a pair of opposite down-reaching fingers located at either side of the path of the tubes from said guide and a downwardly pointing air delivery nozzle above the path of the tubes from said guide.

4. In a delivery mechanism for tubes the combination of a hopper, a tube delivery guide contiguous to one end of said hopper, a pair of opposite down-reaching fingers located at either side of the path of the tubes from said guide and a downwardly pointing air delivery nozzle above the path of the tubes from said guide, said nozzle being near the delivery end of said delivery guide.

5. In a delivery mechanism for tubes the combination of a hopper, a tube delivery guide contiguous to one end of said hopper, two pairs of opposite down-reaching fingers located at either side respectively of the path of the tubes from said guide and a downwardly pointing air delivery nozzle above the path of the tubes from said guide.

6. In a delivery mechanism for tubes the combination of a hopper, a tube delivery guide contiguous to one end of said hopper, two pairs of opposite down-reaching fingers located at either side respectively of the path of the tubes from said guide and a downwardly pointing air delivery nozzle above the path of the tubes from said guide, said nozzle being near the delivery end of said delivery guide.

In witness whereof I hereby affix my signature this 20th day of September, 1928.

CHARLES F. SMITH.