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MEANS FOR DISPENSING GLUE OR ADHESIVES IN PREDETERMINED VOLUMES, PARTICULARLY FOR USE IN THE MANUFACTURE OF PACKAGES OF CARDBOARD

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FIG.1

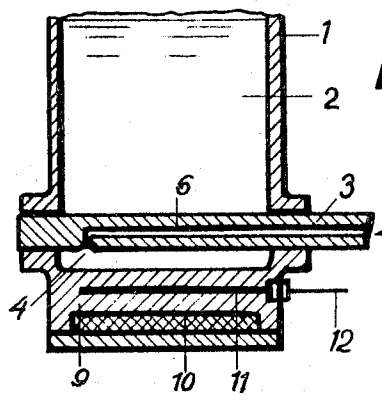


FIG.2

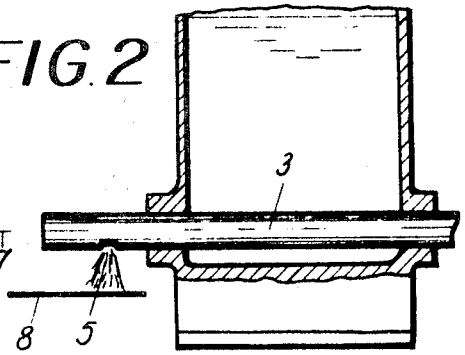


FIG.3

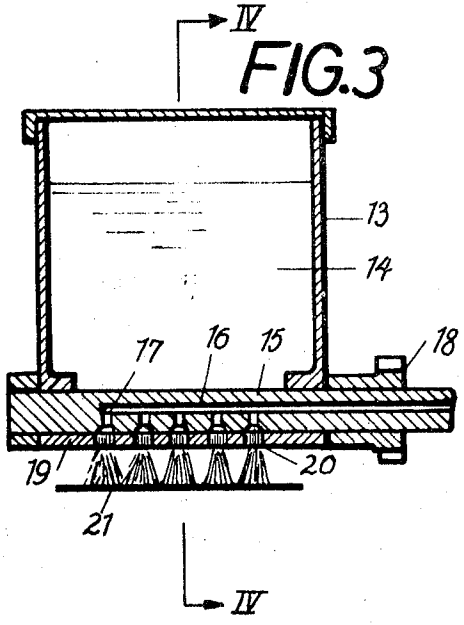
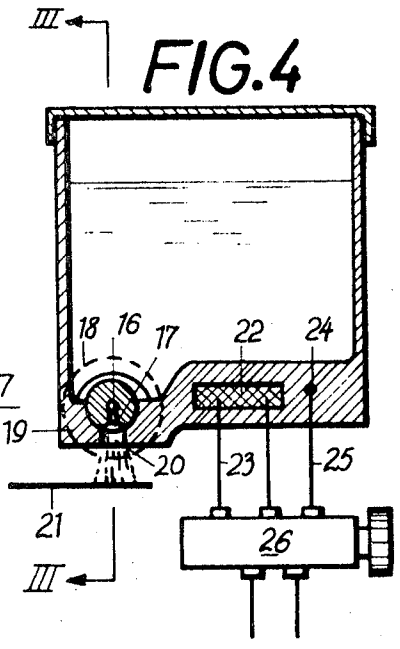


FIG.4



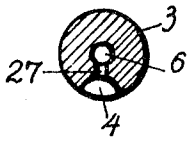


FIG.5

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MEANS FOR DISPENSING GLUE OR ADHESIVES IN PREDETERMINED VOLUMES, PARTICULARLY FOR USE IN THE MANUFACTURE OF PACKAGES OF CARDBOARD

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U.S. Cl. 222—146 4 Claims

ABSTRACT OF THE DISCLOSURE

Application of glue or other adhesives to cardboard blanks which are to be formed into cardboard boxes or other types of packages, is made by means of movable members having recesses for reception of a predetermined volume of adhesive when moved into same, the adhesive being applied to the blank by an air burst supplied to the recesses through channels in said members.

The invention is related to means for applying glue or similar adhesive on various parts of blanks of cardboard for packages in the manufacture of cardboard boxes and similar containers, which finally may be closed and sealed.

The conventional types of glue for this purpose are of a comparatively high viscosity due to the working principles of the machines, and these types of glue need a long drying time which necessitates large machines. This difficulty may be overcome by using types of glue which are solid at ordinary temperature and which are applied in hot condition, the glue solidifying so rapidly that the excessive drying time is eliminated. A well suited glue of this type is marketed under the name "hot melt," and the purpose of the invention is to provide means, utilizing this or other types of glue which are to be transferred to the cardboard blank in hot condition immediately prior to folding of the blanks to boxes. This is in accordance with the invention achieved by placing the hot glue in one or in a plurality of small predetermined portions on a dispensing member cooperating with the container for the glue, the dispensing member being provided with channels which through a valve is connected to a source of gas under pressure, from which a gas burst at the correct moment will "shoot" the glue portions on to the correct location on the cardboard blank, which immediately and prior to solidifying of the glue, is folded to the required box, while the glue still is sticking. The applicator device comprises a heated container for the glue, the container being provided with the dispensing member preferably in the form of a round bar or shaft which on the surfaces is provided with recesses of a volume corresponding to the desired volume of the glue portion, the member being so supported in the container that the recesses may be brought into a desired position in relation to that part of the cardboard blank on which the glue portions are to be placed. The recesses are through channels in the dispensing member in connection with a source of air under pressure, from which powerful air burst at the right moment will "shoot" the glue portions from the recesses on to the blank which has been brought into correct position in the machine. The dispensing member is thereafter moved in such a manner in relation to the glue container that the recesses in its surface may be filled with new portions of glue and then again it returns to position for "shooting" of the glue on to the succeeding cardboard blank.

The glue container is provided with thermostatically controlled heating elements, the sensing component of

which being located in the material of the container so that it will not contact the glue and consequently overheating of the glue is avoided.

The invention will in the following be described more in detail with reference to the drawing on which:

FIGURE 1 is a section through an embodiment of the invention, with the dispensing member in filling position in the container.

FIGURE 2 is a corresponding section where the dispensing member is in "shooting" position,

FIGURE 3 is a section through another embodiment of the invention, the section being taken along the line III—III on FIGURE 4,

FIGURE 4 is a section taken along the line IV—IV on FIGURE 3, and

FIGURE 5 is a section through the dispensing member to an enlarged scale.

On FIGURES 1 and 2 the glue container **1** with a certain volume of glue **2** is provided with a dispensing member **3**, which in this embodiment has the form of a slide. The slide has on its surface a recess **4** in communication with a centrally located channel **6** which by means of a flexible hose is in connection with a source of compressed air (not shown). In the bottom of the container **9** there is provided a heating element **10** which is thermostatically controlled, the temperature sensing means **11** being connected to a control device by means of a thin tube **12**. When the slide is in the position shown on FIGURE 1, the glue will fill the recess **4**, and when the slide is moved out of the container, as shown on FIGURE 2, the glue portion in the recess will be in correct position above a cardboard blank **8** and the glue will by a released air burst as indicated by the arrow **7**, through the channel **6** be "shot" onto the cardboard blank as a spray of droplets distributed on the blank in a circular area. The slide is then again moved into the container to the position shown on FIGURE 1 in order to refill the recess with another portion of glue. Simultaneously with the feeding of the succeeding cardboard blank the slide is moved out of the container to the position shown on FIGURE 2, and the glue portion will be shot down on to the blank by another air burst.

The synchronization of the feeding of the cardboard blanks and the advance of same, with the reciprocation of the slide and the air bursts from the source of compressed air, is carried out by means of microswitches acted upon by the advanced cardboard blanks or by any of the other components in motion, the microswitches giving bursts to electromagnetic valves controlling the compressed air to and from the various pneumatic cylinders in the machine.

On FIGURES 1 and 2 the slide is shown with only one recess, but the number of recesses may be adjusted to the purpose in each case. The slide may further be rotated 90° or 180° if it is advantageous to be able to shoot the glue on to cardboard blanks having such positions that the glue has to be shot in other directions than downwardly as shown on the drawing.

FIGURES 3 and 4 discloses an embodiment of the invention in which a row of glue dots is applied to a blank in one operation. The dispensing member **15** is provided with five recesses **17** and the dispensing member **15** is rotatable in the bottom section **19** of the glue container, the rotation bringing the recesses **17** into alignment with a row of apertures **20** in the bottom of the container when the dispensing member is in position for transfer of the glue to the cardboard blank. FIGS. 3 and 4 show the rotatable dispensing member **15** in the discharge position. The recesses are, through channels **27** (FIGURE 5) and **16**, in communication with a source of compressed air (not shown). The supply of compressed air is controlled

by an electromagnetically operated air valve having a time relay. The valve is operated by a micro switch when the advanced cardboard blank touches the switch when the blank is in correct position under the dispensing member. The rotatable dispensing member **15** is provided with a gear wheel **18** which by means of a rack (not shown) may be rotated 180° about its axis, so that the dispensing member after each dispensing of glue onto the cardboard blank **21** is rotated 180°. Thus the recesses will be directed up into the container **13** and they will be filed with glue.

The electric heating element **22** with leads **23** are diagrammatically shown on FIGURE 4, connected to a controller **26** which, through the thin tube **25**, is connected to a temperature censor **24**.

FIGURE 5 is a section through the dispensing members **3** and **15** with the centrally located air channel **6** (**16**) and the transverse chanel **27** with the recesses **4**. The recesses are shown semispherical, but may also be of a conical shape or design in any other suitable manner.

Due to the effective distribution of the glue on the cardboard blank obtained with the described means, the quantities of glue used may be reduced, and it is possible to employ glue types which previously could not be used due to their high viscosity.

The term "glue" includes in this case any adhesive suitable for this particular purpose.

I claim:

1. Apparatus for dispensing a fluid adhesive in small proportions onto a surface to be adhered, particularly for the manufacture of packages and boxes of cardboard and similar materials, said apparatus including a container for the fluid adhesive, a rotatable dispensing member rotatably supported in the container with its surface in engagement with a portion of the wall of the container, said portion of the container wall in engagement with the rotatable dispensing member being provided with a discharge aperture for fluid adhesive, the surface of the rotatable dispensing member being provided with a recess for receiving a portion of adhesive when the recess is in a position facing into the fluid adhesive in the container, a passageway for gas under pressure located in the rotatable dispensing member, a channel connecting said passageway with the inner portion of said recess, said recess being adapted to register with the aperture in the container wall when the rotatable dispensing member is rotated from said position to a position to a position in which the recess in the rotatable dispensing member is in alignment with the discharge aperture, said recess then being in a position to receive a gas burst from said passageway for shooting a portion of adhesive in the recess through the discharge aperture onto the surface to be adhered.

2. Apparatus as claimed in claim **1**, wherein the portion of the container wall in engagement with the rotatable dispensing member is provided with a row of discharge apertures, and wherein the rotatable dispensing member is provided with a row of recesses for receiving adhesive, said recesses being adapted to be brought into alignment with the respective apertures in the container wall.

3. Apparatus as claimed in claim **2**, wherein the distances between adjacent apertures and recesses are less than the diameter of each of the applied adhesive dots so that the dots in the row overlap each other.

4. Apparatus as claimed in claim **1**, including an electric heating element mounted in the bottom wall of the container, a controller connected by leads to the heating element, a temperature sensor located in the bottom wall of the container in spaced relation to the heating element. and means connecting the temperature sensor to the controller.

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WALTER SOBIN, Primary Examiner

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