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C. M. EDWARDS

2,249,200

ADHESIVE APPLICATOR FOR PAPER TAPE

Filed April 3, 1939

2 Sheets-Sheet 1

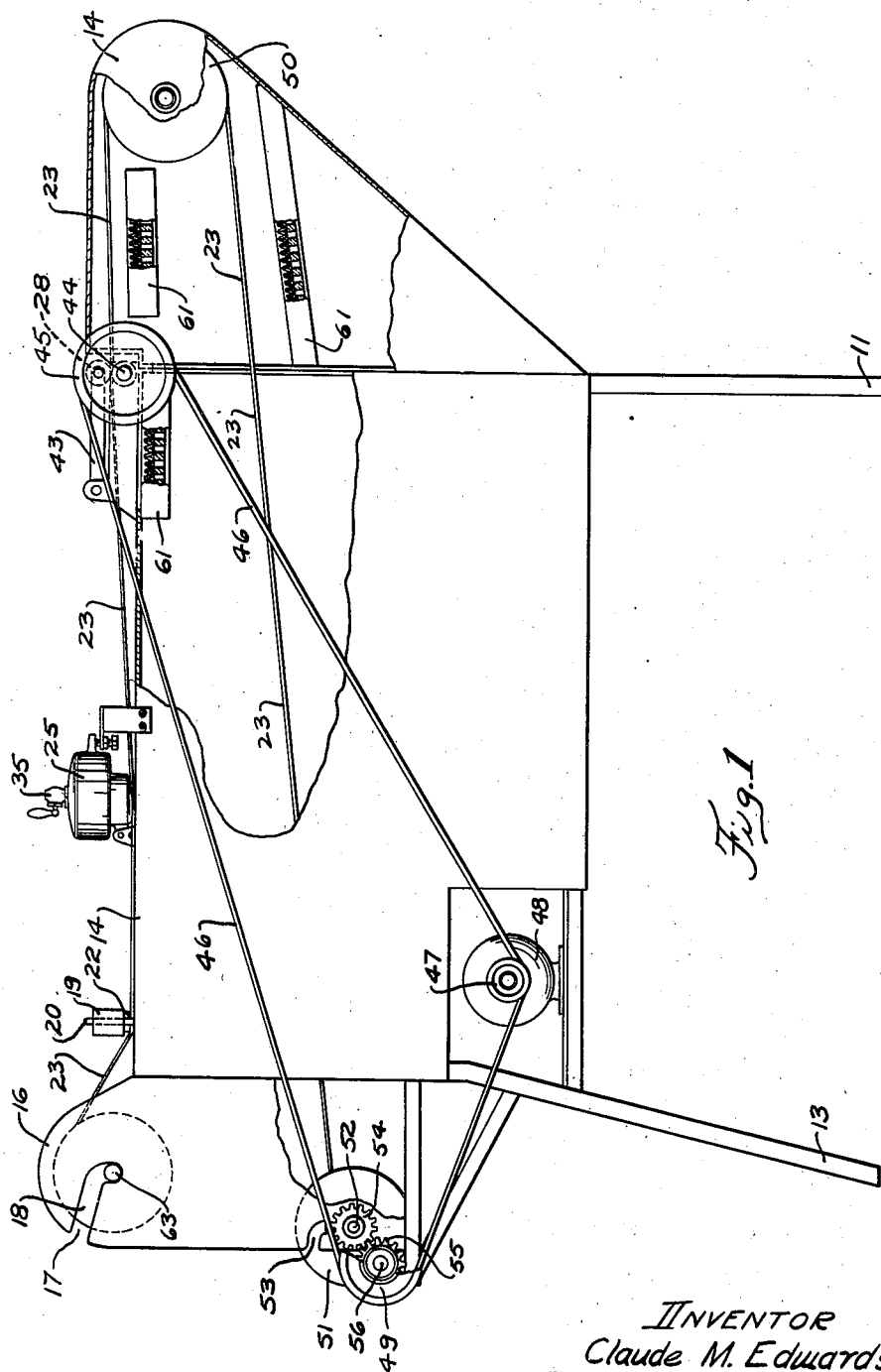


Fig. 1

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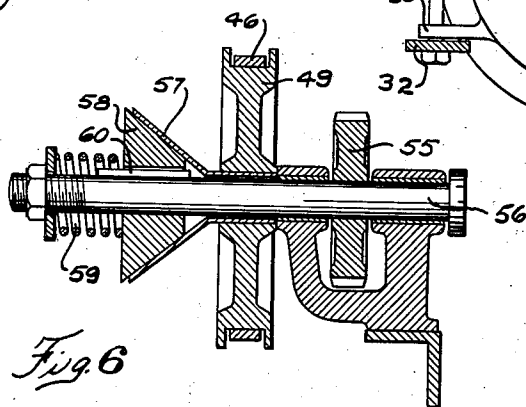
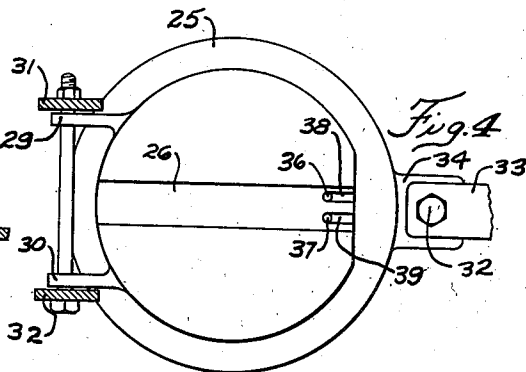
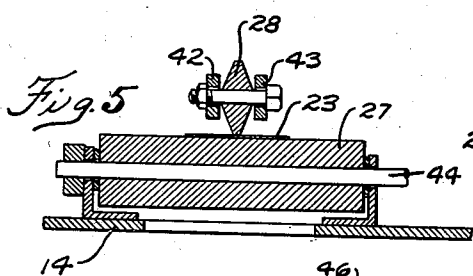
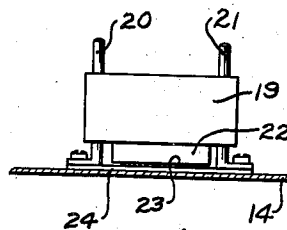
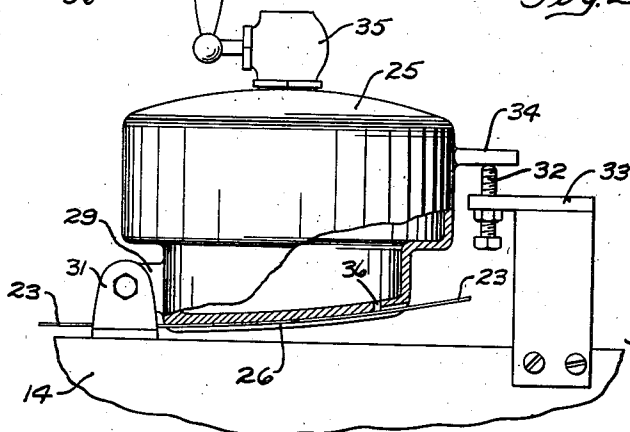
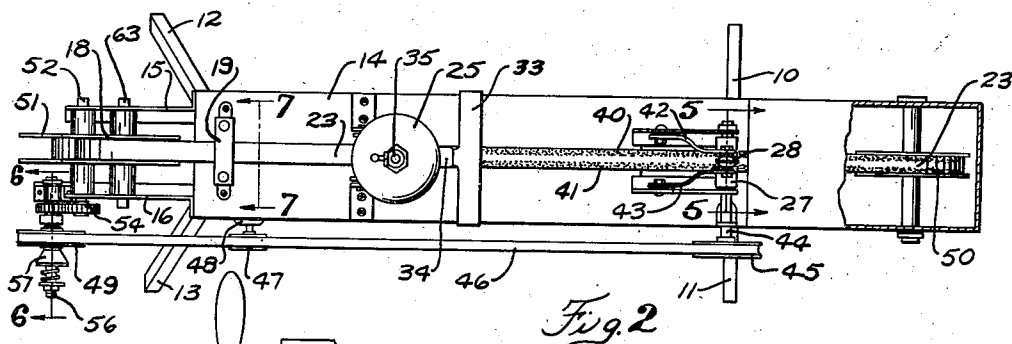
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ADHESIVE APPLICATOR FOR PAPER TAPE

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2 Sheets-Sheet 2



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2,249,200

ADHESIVE APPLICATOR FOR PAPER TAPE

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Application April 3, 1939, Serial No. 265,697

4 Claims. (Cl. 91—12)

This invention relates to means for applying an adhesive to paper tape and has for a primary object the provision of mechanical means for applying the adhesive and rapidly drying it to permit the tape to be re-wound, all within a short compact machine.

A further important object of the invention is to provide a great saving of time in the gumming of the tape and also in providing a very effective and simple means for controlling the amount of adhesive placed on the tape.

These and other important objects of the invention, including the novel associations of the various elements entering into the machine embodying the invention as set forth in the appended claims, will become apparent to those versed in the art in the following description of one particular form of the invention as illustrated more or less diagrammatically in the accompanying drawings, in which

Fig. 1 is a side elevation of a machine embodying the invention;

Fig. 2, a top plan view;

Fig. 3, a detail in side elevation and partial section of the adhesive applicator on an enlarged scale;

Fig. 4, a bottom plan view;

Fig. 5, a transverse vertical section on the line 5—5 in Fig. 2;

Fig. 6, a detail in vertical transverse section on the line 6—6 in Fig. 2; and

Fig. 7, a detail in section on the line 7—7 in Fig. 2.

Like characters of reference indicate like parts throughout the several views in the drawings.

Supported upon suitable legs 10, 11, 12 and 13, is a body 14 having tape-reel carrier plates 15 and 16 at its rear end, each plate being provided with a slot, Fig. 1, 17 entering from the rear edge and terminating in a downturned portion to carry the axle 63 on which the reel 18 is mounted. Forwardly of the reel 18 and mounted on the top of the body 14 is a tape brake consisting of a weight 19 normally dropping under the influence of gravity between the vertical slides 20 and 21 to bear through a layer of felt 22 on the weight against the tape 23 which may rest directly upon the top of the body 14 but preferably passing over a raised bar or rib 24. Not only does the weight 19 serve to retard the passage of the tape 23 thereunder, but by means of the felt 22, the tape is wiped as it passes thereunder to free it of the lint generally adhering to the tape.

From the brake, the tape 23 is carried forwardly under the adhesive container 25 to pass

through a slot 26 longitudinally placed across its under-side and then be carried on over a feed roll 27 against which yieldingly bears a pressure roller 28. The container 25 is preferably mounted to be vertically adjustable in relation to the tape 23, particularly in relation to that part of the tape as it leaves the forward side of the container. In the form herein shown, this vertical adjustment is achieved by hinging the container 25 at its rear end through ears 29 and 30 to the brackets 31 and 32 carried by the body 14. The forward end of the container 25 is raised and lowered through any suitable adjusting means, herein shown in an elemental form as a screw 32 carried by a bracket 33 fixed to the body 14. This screw 32 may be shifted upwardly and downwardly in contact with a finger 34 extending from the container 25. The container 25 is preferably of the closed type so that the upper surface of the adhesive contained therein will be removed from direct exposure to the atmosphere. A vent valve 35 is carried by the container 25 in order to close off the atmosphere from the container.

The floor of the container 25 is provided with a pair of laterally spaced apart passageways 36 and 37 through which the adhesive may flow by gravity from the container 25 onto the tape 23. Each of these passageways 36 and 37 have discharge orifices within the confines of the slot 26. Furthermore, from each of these passageways 36 lead respectively the slots 38 and 39 opening downwardly within the principal slot 26 and opening forwardly at the front wall of the container. In other words, these two minor slots 38 and 39 lead forwardly in the direction of travel of the tape 23. By suitable lifting or lowering of the container 25, the desired amount of adhesive may be deposited upon the tape 23 as the tape is shifted along through the slot 26. Obviously by lifting the container 25, more adhesive will be deposited upon the tape than when the container is lowered.

The size of each of the orifices opening from the passageways 36 and 37 in the slot 26 are made to be such that the adhesive is deposited not entirely across the tape but only in two separated paths, one path adjacent each edge of the tape as indicated in Fig. 2 by the paths 40 and 41. This leaves the central portion of the tape entirely free of adhesive.

While the entire under-side of the tape 23 bears against and is carried over the roller 27, the pressure roller 28 has a periphery sufficiently narrow as to bear against the tape only in that central portion which is free of adhesive. This

roller 23 may, of course, be directed against the tape 23 to exert pressure thereon in any suitable manner, being herein shown as dropping by gravity by reason of its being carried between the two arms 42 and 43 which are hingedly supported at their rear ends by the body 14. The shaft 44 which carries the roller 27 is power driven by any suitable means, such as by a belt 46 passing around a pulley 45 on the shaft 44 and a pulley 47 on a motor 48, the belt 46 also extending around a re-wind drive pulley 49. Operation of the motor 48 through the belt 46 pulls the tape 23 forwardly from the adhesive container 25.

The tape 23, as it leaves the pulling roller 27, is carried around an idler pulley 50 at the extreme front end of the machine and then is carried rearwardly through the body of the machine to a re-wind reel 51 mounted at the extreme rear end of the body on a removable shaft 52. This shaft 52 is carried by the plates 15 and 16, each of which carries a slot 53 entering from the rear edge and thence turning downwardly. The shaft 52 carries a spur gear 54 which, when the shaft 52 is in the lower end of the slot 53, meshes with a spur gear 55 which in turn is fixed on a stub shaft 56, on which the pulley 49 is slidingly carried so as to be free to turn independently of the shaft. However, the pulley 49 carries a clutch member 57, herein shown as an outwardly flaring conical member opening from its outer side to receive in frictional engagement a second clutch member 58 normally urged toward the member 57 by means of a compression spring 59. The member 58 is free to slide longitudinally of the shaft 56 but is rotated therewith by any suitable means, such as the key 60.

Since the tape 23 builds up on the reel 51 to an increasing diameter, the reel 51 must have provision made for differences in driving speeds to prevent breaking of the tape, and this clutch device above explained is thus interposed between the pulley 49 and the driving gear 55 so that when the tension on the tape 23 reaches a predetermined amount, slippage may occur between the clutch members 57 and 58 without damage to the tape and yet insuring sufficient tension upon the tape to wind the tape compactly on the reel 51.

The body 14 is completely enclosed, particularly at its forward end, to form a heating oven or tunnel through which the tape 23 is carried from the roller 27 and around the pulley 50 to be exposed to heat generated by any suitable means, such as the electric heating units 61, herein shown as three in number, with the first unit being applied directly under the tape adjacent the drive roller 27 which is relatively close to the adhesive container 25. The walls of the body 14 are carried upwardly to extend over the tape 23 between the roller 27 and the forward pulley 50 so as to maintain a highly heated chamber in that forward portion of the body.

By selection of the proper adhesive having normally quick drying properties, and applying the required degree of heat carried up to a temperature as high as possible without deteriorating effect upon the paper itself, rapid drying of the adhesive is had within a very short space of travel of the tape, and, therefore, by the time the tape 23 reaches the roller 51, the tape may be safely wound.

An extremely important advantage of the structure above described is that paper of extremely poor quality, if required, may be em-

ployed since, at any time, there is very slight tension applied to the tape and particularly since there is always a central area of the tape that is not coated with the adhesive but is left in a clean dry state, this central area being the part which in reality takes the initial stress of pulling the tape over the roller 14 through the pressure roller 28. Of course, various widths of tapes may be employed by either substituting an adhesive container with the proper width of slot 26 or by employing a sufficiently wide slot as will take the widest tape used. It is preferable, however, to keep the width of the slot 26 to be substantially that of the tape so that this slot may serve as a guide for aligning the tape as it is pulled forwardly from the tape brake to the pulling roller 27. It is to be further observed that when the tape is being pulled past the adhesive container 25, the vent valve 35 will be open to permit the flow of adhesive downwardly through the passageways 36 and 37, and upon stoppage of the tape, this valve 35 may be closed to prevent further feeding.

While I have herein shown and described my invention in the one particular form, it is obvious that structural changes may be employed without departing from the spirit of the invention and I, therefore, do not desire to be limited to that precise form beyond the limitations as may be imposed by the following claims.

I claim:

1. In a machine for applying adhesive to a tape, means supporting a roll of tape; tape winding and tensioning means; an adhesive container; tape guide means carried on the underside of the container; said container having spaced apart adhesive discharge orifices over the path of said tape and being so spaced as to leave a non-adhesive coated track along the tape; means for varying the amount of adhesive to be applied to the tape; a driven roller over which said tape is carried; a pressure roller yieldingly directed toward said driven roller to press said tape thereagainst; and said pressure roller having a peripheral face limited in width to that of said track to be out of contact with said adhesive.

2. In a machine for applying adhesive to a tape, friction, wiping means tending to restrain travel of the tape; an adhesive container following the friction means; said container having a longitudinal groove across its underside through which said tape is guided; a pair of adhesive discharge orifices in said groove adjacent the trailing end of the groove; a longitudinal groove leading in said container groove through said end from each of said orifices; said container being longitudinally rockable; means controlling the rocking of the container; said container being formed in conjunction with said orifices to distribute adhesive on the tape in spaced apart tracks to leave a continuous longitudinal area free of adhesive; a tape pulling roller over which the tape carrying the adhesive is passed; and a pressure roller yieldingly pressing the tape against the pulling roller; said pressure roller having a peripheral tape contacting surface sufficiently narrow to ride within said adhesive-free area.

3. In a machine for applying adhesive to a tape, friction, wiping means tending to restrain travel of the tape; an adhesive container following the friction means; said container having a longitudinal groove across its underside through which said tape is guided; a pair of adhesive discharge orifices in said groove adjacent the trail-

ing end of the groove; a longitudinal groove leading in said container groove through said end from each of said orifices; said container being longitudinally rockable; means controlling the rocking of the container; said container being formed in conjunction with said orifices to distribute adhesive on the tape in spaced apart tracks to leave a continuous longitudinal area free of adhesive; a tape pulling roller over which the tape carrying the adhesive is passed; and a pressure roller yieldingly pressing the tape against the pulling roller; said pressure roller having a peripheral tape contacting surface sufficiently narrow to ride within said adhesive-free area; and means taking up the tape fed from said pulling roller to maintain a predetermined tension in the tape.

4. In a machine for applying adhesive to a tape, friction means, wiping means tending to restrain travel of the tape; an adhesive container

5 following the friction means, said container having means by which said tape is guided; a pair of adhesive discharge orifices; a longitudinal groove leading from each of said orifices; said container being longitudinally rockable; means controlling the rocking of the container; said container being formed in conjunction with said orifices to distribute adhesive on the tape in spaced apart tracks to leave a continuous longitudinal area free of adhesive; a tape pulling roller over which the tape carrying the adhesive is passed; and a pressure roller yieldingly pressing the tape against the pulling roller; said pressure roller having a peripheral tape contacting surface sufficiently narrow to ride within said adhesive-free area; and means taking up the tape fed from said pulling roller to maintain a predetermined tension in the tape.

CLAUDE M. EDWARDS.