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MECHANISM FOR CUTTING AND APPLYING GLUE TO SHEET MATERIAL

Filed Nov. 27, 1936

2 Sheets-Sheet 1

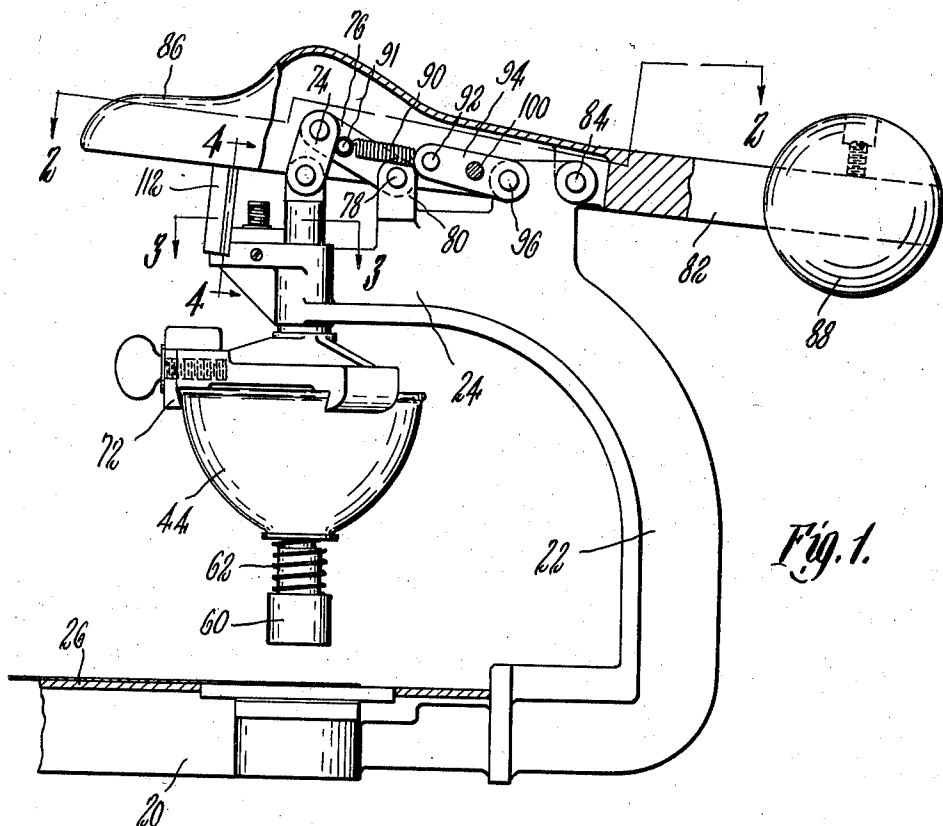


Fig. 1.

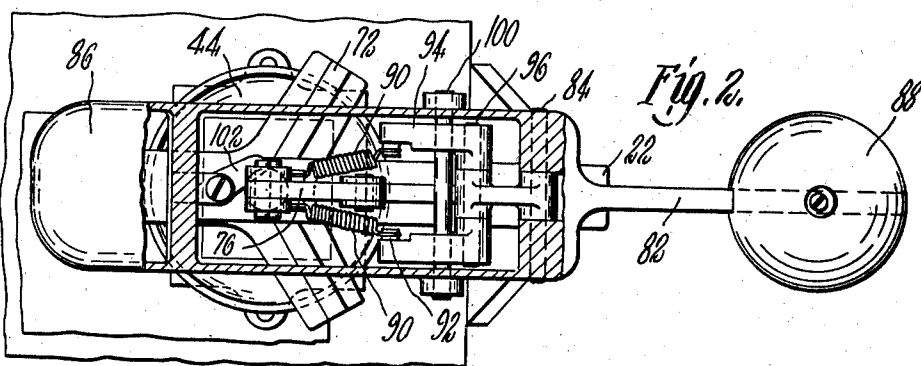


Fig. 2.

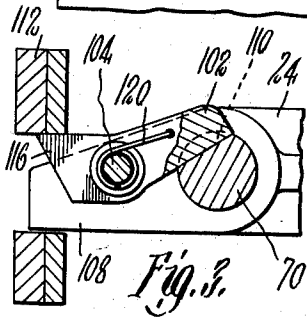


Fig. 3.

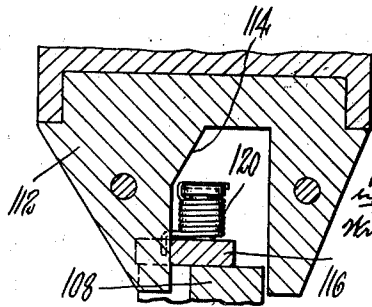


Fig. 4.

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2 Sheets-Sheet 2

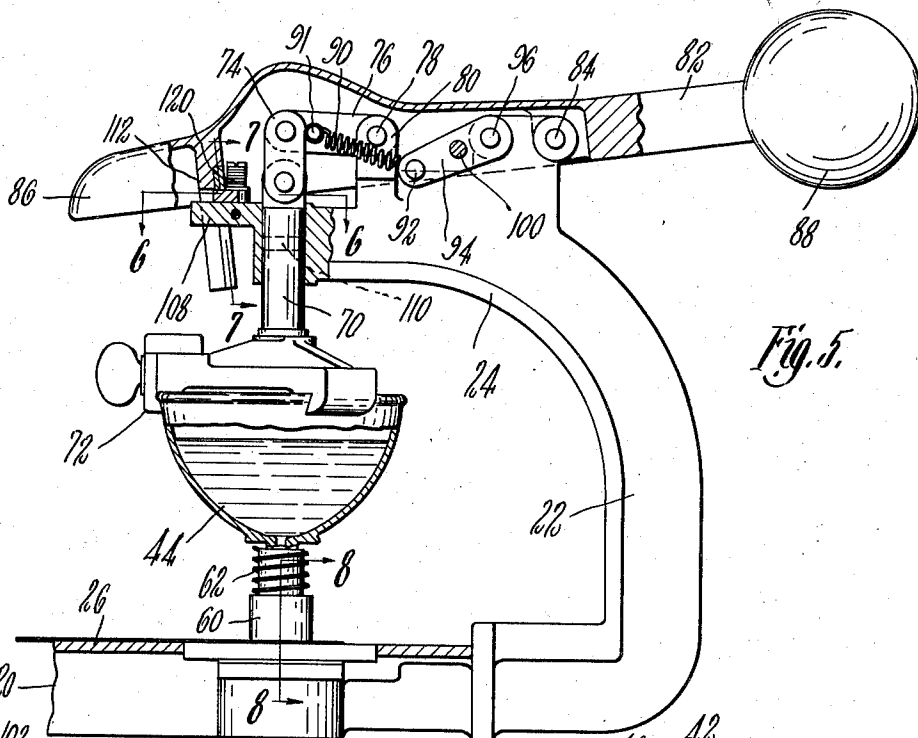


Fig. 5.

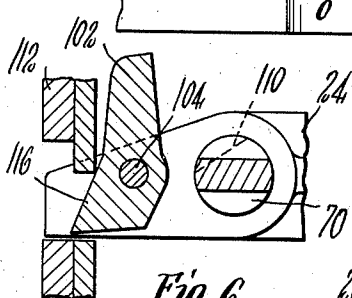


Fig. 6.

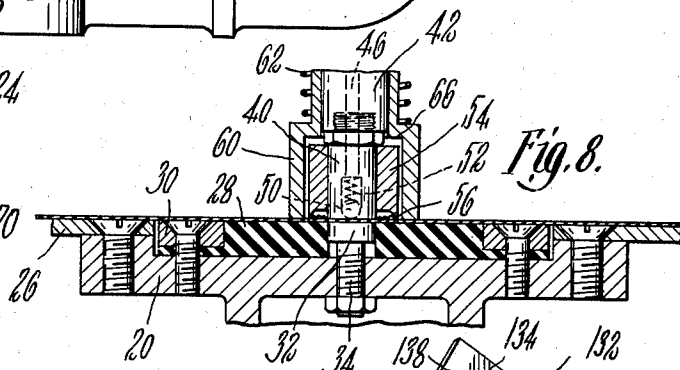


Fig. 8.

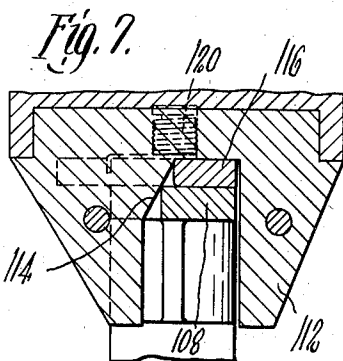
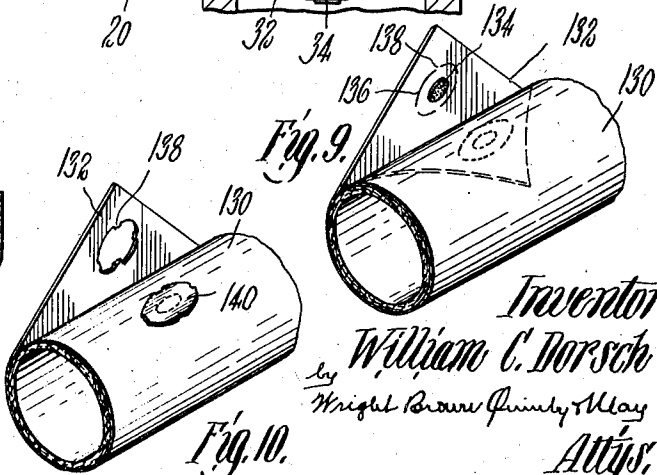


Fig. 7.



UNITED STATES PATENT OFFICE

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MECHANISM FOR CUTTING AND APPLYING
GLUE TO SHEET MATERIAL

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10 Claims. (Cl. 91—14)

This invention relates to a mechanism for applying a spot of adhesive material such as glue to a paper wrapper or the like and at the same time making suitable cuts around the spot of glue so as to form an easily detachable gummed area on the wrapper. The purpose of this area is to facilitate the removal of the wrapper from a package about which it has been secured by means of the glue.

It is an object of the invention to provide a mechanism of this kind which will be uniform and positive in its action and will be easy to operate.

Various advantageous features will be apparent to one skilled in the art from a disclosure of an embodiment of the invention hereinafter described and illustrated on the drawings of which

Figure 1 is a side elevation of a mechanism embodying the invention, portions of the apparatus being broken away to show in section.

Figure 2 is a section on the line 2—2 of Figure 1.

Figure 3 is a section on the line 4—4 of Figure 1.

Figure 4 is a section on the line 4—4 of Figure 1.

Figure 5 is a side elevation of the mechanism shown in Figure 1, the parts being shown in a different position of operation, and some of the members being broken away to show in section.

Figure 6 is a section on the line 6—6 of Figure 5.

Figure 7 is a section on the line 7—7 of Figure 5.

Figure 8 is a section on the line 8—8 of Figure 5.

Figure 9 is a perspective view of a cylindrical package to which an improved wrapper has been applied but not secured.

Figure 10 is a similar perspective view after the seal of the wrapper has been made and broken.

The mechanism illustrated on the drawings is intended to operate on paper wrappers or the like so as to daub on an end or corner thereof a spot of adhesive material such as glue, and, at the same time, to make suitable cuts around the spot of glue so that, when the wrapper is to be removed from the package to which it has been applied, the cemented end or corner may be torn away from the small portion thereof which is stuck to another portion of the wrapper by the glue. If used where packages are being made up and wrapped, the device may

be employed to operate on an end or corner of the wrapper immediately prior to the completion of the wrapping operation so that the gummed end or corner of the wrapper may be forthwith caused to adhere to another portion of the wrapper so as to seal the package before the glue dries or sets.

According to the invention, the improved mechanism may include a frame having a base portion 20 and an upright portion 22 supporting a bracket portion 24 which overhangs the base. Mounted on the base is a suitable work table 26 which is preferably horizontal and which is provided with a resilient member 28 of rubber or the like set into the center thereof flush with the surface. A rectangular element 30 may be employed to secure the rubber mat 28 in place. In the center of the rubber mat 28 is an anvil which, as indicated in Figure 8, may be carried by a threaded stem 34 projecting through the upper portion of the base 20 so as to be vertically adjustable. The surface of the anvil is preferably circular and flush with the adjacent surface of the rubber mat 28. Immediately above the anvil 32 is a nozzle 40, this nozzle being removably attached to an extension 42 which projects downward from a receptacle or cup 44 adapted to hold a supply of liquid such as glue. The extension 42 and the nozzle 40 are provided with a duct 46 through which the glue may flow from the cup 44 to a central opening in the flat end of the nozzle. The opening in the end of the nozzle is smaller in diameter than the portion of the duct adjacent thereto and is normally closed by valve means consisting of a ball 50 within the duct 46 which is pressed by a spring 52 and is normally seated in the opening. When so seated, a portion of the ball projects beyond the end face of the nozzle 40. The opposed faces of the nozzle and anvil are preferably of the same size and shape and the nozzle is mounted so as to be directly above the anvil, so that, when reciprocated vertically as herein-after described, the nozzle will engage the anvil or the work which may be resting upon the anvil.

A cutting die 54 surrounds the nozzle member 40 and is mounted thereon with a drive fit so that it is substantially integral therewith in the assembled machine. This cutting die is provided with a circular series of sharp teeth 56 spaced about the axis of the nozzle member arranged in four quadrants which are separated by narrow gaps. The teeth penetrate the work and may be employed to cut either groups of perforations or

continuous quadrantal lines separated by the narrow portions of the work left uncut by the gaps between the segments of the cutting edges. The cutting edges 56 are spaced laterally from the nozzle, as indicated in Figure 8, so as to be directly above a portion of the resilient element 28 of the work table. Surrounding the cutting die 54 is a stripper element 60 which is loosely slidable on the extension 42 below the cup 44 and is pressed downward as by a suitable spring 62, its downward movement relative to the extension being limited by an annular shoulder 66 which engages the upper end of the cutting die 54 when the lower end of the stripper element 60 projects somewhat below the plane of the cutting edges 56. Thus, when the nozzle and cutter descend to apply glue to a portion of the work and to make cuts in adjacent portions of the work, the work is first engaged by the lower end of the stripper element 60 which is normally in advance of the cutter and nozzle. After the cutter and nozzle have descended further to operate upon the work, the stripper holds the work down during the initial upward movement of the cutter and nozzle, thus preventing the work from adhering to the cutter or nozzle.

Mechanism for vertically reciprocating the cup 44 and the members secured thereto as hereinbefore described, is mounted on the frame bracket 24 and may comprise a vertically reciprocable plunger 70 having a suitable clamping means 72 by which the cup 44 is removably attached thereto in such a manner that the nozzle 40 is aligned with the plunger 70. The upper end of the plunger 70 is attached as by a pair of vertical links 74 to a horizontal link 76 which in turn is pivotally attached as at 78 to a pair of ears 80 rising from the bracket 24. An operating lever 82 is pivoted to the bracket 24 as at 84, the forward end portion 86 of this lever being conveniently shaped for manual operation to depress this end of the lever. At the opposite end of the lever is mounted a suitable weight 88 sufficient to rock the lever back to the normal position illustrated in Figure 1 when the lever has been manually rocked to depress the forward end thereof, the weight being adjustable toward or from the fulcrum 84. The lever 82, as shown, is not directly connected to the plunger 70 for the reciprocation thereof. Instead, the plunger is actuated by a pair of springs 90 which are attached to the horizontal link 76 at a point remote from the pivot 78, the springs 90 being attached to the horizontal link 76 at a point 91 remote from the pivot 78, the springs 90 being attached as at 92 at their other ends to a pair of rocking arms 94 which rock together about an axis 96 as illustrated in Figure 2. The arms 94 are adapted to rock between two positions in which the points 92 are respectively on one side or the other of the line between the pivot points 78 and 91. This arrangement thus constitutes a snap-action device adapted to raise and lower the plunger 70 according to the position of the rock arms 94. When these rock arms are swung up as in Figure 1, the springs 90 tend to raise the plunger 70. When the arms 94 are swung down as in Figure 5, the springs 90 tend to lower the plunger 70. The arms 94 are rocked from one position to the other by a pin 100 which extends through these arms and also through the rocking lever 82. Thus, when the rocking lever 82 rocks up or down, this results in the rocking of the arms 94 up or down, thus conditioning the snap-action device for the raising or lowering of the plunger

70 in accordance with the direction of rocking movement of the arms 82 and 94.

Downward movement of the plunger 70 is normally prevented by a latch 102 which is pivoted as at 104 on a bracket element 108 projecting from the frame bracket 24. The latch 102 engages in a lateral slot 110 in the plunger 70, this latch preventing movement of the plunger while it is so engaged. The forward end portion 86 of the rocking lever 82 is provided with a downwardly projecting member 112 which is centrally cut away so as to provide a sloping cam surface 114. As the member 112 descends with the end portion 86 when the lever 82 is rocked, the sloping cam edge 114 engages a portion 116 of the latch member 102 in such a way as to swing the latch clear of the plunger. The mechanism is so adjusted as to trip the latch 102 after the rock arms 94 have been swung so as to condition the snap action device for lowering the plunger 70 as illustrated in Figure 5. Thus, at the moment when the latch 102 is tripped, the springs 90 are arranged to rock the link 76 downward. This results in a downward pressure on the plunger 70 through the connecting links 72. The release of the plunger 70 permits the plunger to move through its downward working stroke under a predetermined force furnished by the tension of the springs 90. It is evident that this force is independent of the manner of operation of the rocking lever 82 so that the working strokes of the plunger, and hence of the nozzle and cutting die attached thereto, are uniform. This means uniformity of operation on successive pieces of work, which is highly desirable. The latch 102 also serves as a stop to limit the downward rocking movement of the control lever, the latch being engaged by the upper end of the cut-out in the member 112 when the latch has been tripped by the cam edge 114, as illustrated in Figure 7. After the operating stroke of the plunger has been completed, the weight 88 is permitted to rock the lever 82 in the reverse direction. This releases the latch 102 which then is swung back into contact with the side of the plunger 70 as by a suitable spring 120. The reverse rocking of the lever 82 elevates the pin 100 which in turn rocks the arms 94 upward, thus conditioning the snap-action device to raise the plunger 70 and the members secured thereto. The plunger thus rises to the position shown in Figure 1, whereupon the latch 102 snaps into the slot 110 and holds the plunger 70 in its elevated position until the next actuation of the control lever 82.

When the nozzle is moved down to engage the work upon the anvil 32, the projecting portion of the ball 53 reaches the work before the end face of the nozzle. The ball is thus forced back into the cavity in which it is located while the end face of the nozzle moves on into engagement with the work to daub a spot of glue thereon. As the nozzle subsequently rises, the ball 50 moves back to its seated position, thus pushing a small quantity of glue through the aperture in the end face of the nozzle, which glue adheres to the end face of the nozzle and is ready for the next operation of the mechanism. Figure 9 illustrates a wrapper which has been operated upon by the mechanism herein shown and described. The wrapper 130 has an end portion 132 which is thrust beneath the nozzle and die. The plunger is then operated as hereinbefore described, so that the nozzle daubs a spot 134 of glue or the like on the portion 132 of the wrapper, and the cutting edges 56 at the same time make quadrantal cuts 136

surrounding the glue spot 134 entirely except for small connecting elements 138 left uncut by the gaps in the cutting edge of the die. When it is desired to remove the wrapper from the package, the end portion 132 is torn away. Owing to the cuts 136, a circular piece 140 of the end portion 132 remains adhering to the package, but the connecting elements 138 are readily broken as indicated in Figure 10, thus permitting the removal of the wrapper from the package.

It is evident that various modifications and changes may be made in the particular embodiment of the invention herein shown and described, without departing from the spirit or scope thereof as defined in the following claims.

I claim:

1. A machine comprising an adhesive applicator, a sheet material cutter having spaced cutting edges arranged about an axis, and means for actuating said applicator and cutter to apply adhesive to an area of sheet material and to partially cut around and sever said area from the remainder of the sheet material.

2. A machine for treating sheet material to form therein an easily detachable gummed area, comprising a glue-applying element, a cutting die surrounding said element, and means for reciprocating said element and die as a unit to and from the work.

3. A machine of the class described, comprising means for weakening the boundaries of a limited area of a piece of sheet material, means for daubing a spot of glue within said area, and means for operating said weakening means and daubing means together as a unit to and from the work.

4. A machine of the class described, comprising a glue-applying element having a supply duct therein, a cutting die surrounding said element, means for reciprocating said element and die together to and from the work, and a normally closed valve means in said duct adapted to open when said element moves into engagement with the work.

5. In a device of the class described, a plunger having a working stroke and a return stroke, a spring snap-action device connected to said plunger and controllable to move said plunger through its working stroke or through its return stroke, latch means normally preventing movement of said plunger in its working stroke, a control member manually movable in one direction to condition said snap-action device for moving said plunger through its working stroke and to trip said latch, and means for yieldingly moving said control member in the other direction to condition said snap-action device to move said plunger through its return stroke.

6. In a device of the class described, a frame having a base and an overhanging bracket, a work-supporting table on said base, a plunger vertically reciprocable in said bracket, a tool carried by said plunger for engagement with work on said table, a spring snap-action device for

moving said plunger up and down, a manually rockable control lever mounted on said bracket, said snap-action device being connected to said lever in such a manner that rocking the lever in one direction conditions the device to raise the plunger and rocking the lever in the other direction conditions the device to lower the plunger, a latch in said head normally engaging said plunger to prevent downward movement thereof, and means on said plunger for tripping said latch to release the plunger at the end of the rocking stroke of the lever for lowering the plunger.

7. A device of the class described, comprising a frame, a work table on said frame, a plunger slidably supported above said table, a cutting die detachably secured to said plunger and movable therewith toward and from said table, a latch normally holding said plunger in elevated position, an operating lever on said frame manually rockable in one direction to trip said latch, spring-actuated means controlled by said lever for moving said plunger down and up, said spring-actuated means being so connected to the lever as to press downward on the plunger when the lever is moved toward its latch-tripping position and to raise the plunger when the lever is rocked in the opposite direction, and means tending to rock said lever in said opposite direction.

8. In a device of the class described, a work-supporting table, a cup above said table having a nozzle projecting downward therefrom, means for lowering and raising said cup to move said nozzle to and from engagement with work on said table, and a cutting die secured to said nozzle and movable therewith to operate on the work.

9. In a device of the class described, a work-supporting table having a rigid surface portion surrounded by an area of yielding surface, a cup having a downward projecting nozzle above said table, means for reciprocating said cup and nozzle down and up so as to move said nozzle to and from said rigid surface portion of the table, a normally closed valve in said nozzle having a portion projecting below the end of the nozzle, said projecting portion being adapted to engage the work on said table to open said valve, and a cutting die secured to said nozzle above said yielding surface portion of the table and reciprocable with said nozzle to and from the work.

10. In a device of the class described, a work-supporting table, a cup above said table having a nozzle projecting downward therefrom, a cutter surrounding said nozzle and secured thereto, the cutting edge of said cutter being approximately flush with the end of the nozzle, a stripper member loosely surrounding said nozzle and cutter to slide thereon, the lower edge of said stripper member normally projecting below the end of the nozzle, spring means pressing said stripper member yieldingly downward, and means for lowering and raising said nozzle, cutter and stripper as a unit to and from said table.

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