

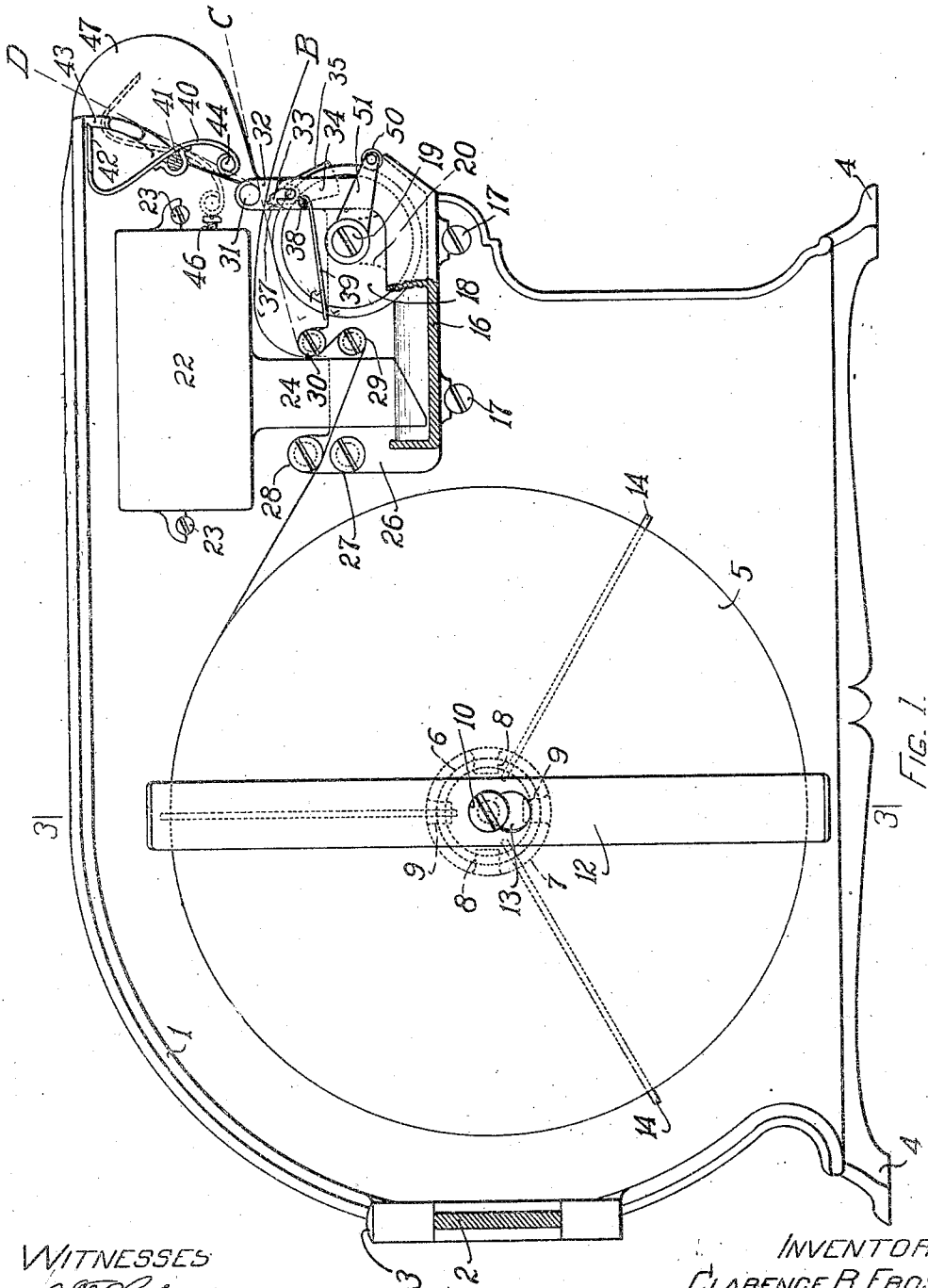
No. 848,892.

PATENTED APR. 2, 1907.

C. B. FROST.
PACKAGE SEALING APPARATUS.

APPLICATION FILED AUG. 8, 1906.

2 SHEETS—SHEET 1.



WITNESSES

A. T. Palmer

Oliver P. Schumann

INVENTOR

CLARENCE B. FROST

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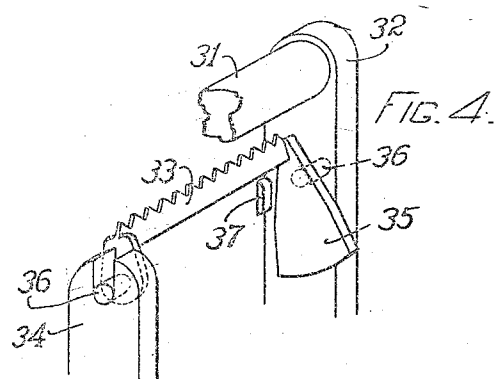
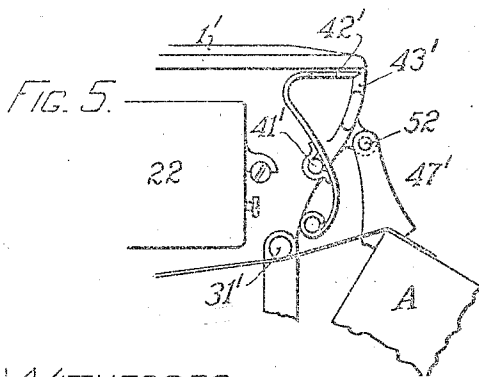
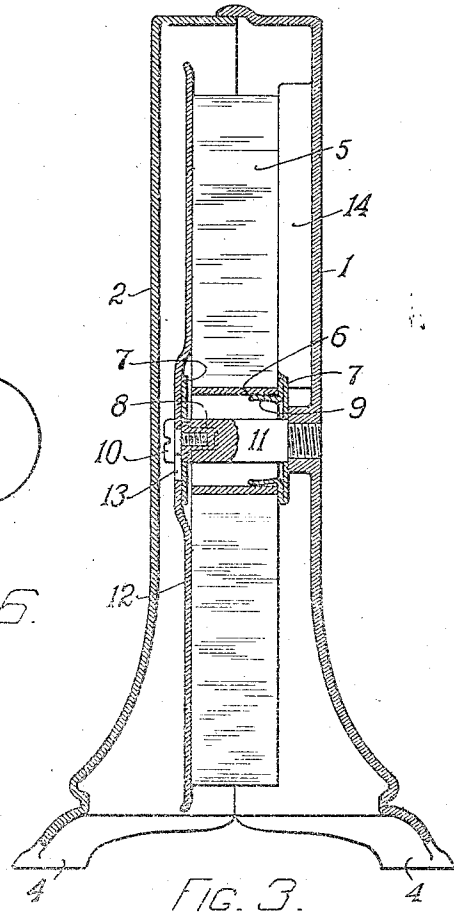
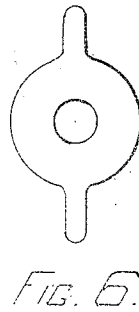
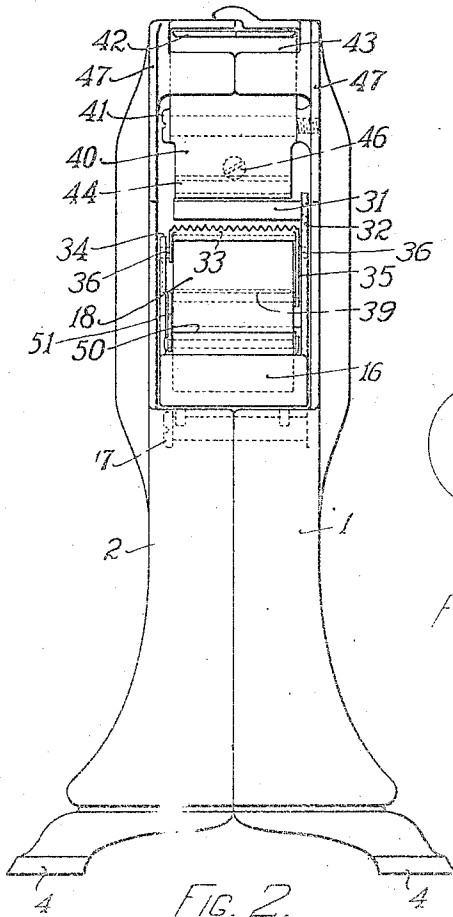
Ernest Kent

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2 SHEETS—SHEET 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

CLARENCE B. FROST, OF CAMBRIDGE, MASSACHUSETTS.

PACKAGE-SEALING APPARATUS.

No. 848,892.

Specification of Letters Patent.

Patented April 2, 1907.

Application filed August 8, 1906. Serial No. 329,668.

To all whom it may concern:

Be it known that I, CLARENCE B. FROST, of Cambridge, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Package-Sealing Apparatus, of which the following is a specification.

This invention relates to package-sealing devices.

In particular, it relates to apparatus for delivering a strip of adhesive tape and severing a suitable portion therefrom for binding and sealing packages.

The objects of the invention are to improve the apparatus for controlling the tape and to perfect the operation of such apparatus in a number of details which hereinafter appear, among which are the arrangements for supporting the supply of tape in the apparatus, the improvement of the moistening apparatus, and the improvement of the various parts of the apparatus which act upon the tape in succession, including the moistening device, the severing apparatus, and the control of the projecting tab end of the tape which remains after a portion has been severed.

One embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation of the apparatus, partly in section, with the cover removed. Fig. 2 is a complete front end elevation of the apparatus shown in Fig. 1. Fig. 3 is the same in section at the plane 3 3 of Fig. 1. Fig. 4 is an enlarged view in perspective of a detail appearing in Figs. 1 and 2. Fig. 5 is a side elevation corresponding to a portion of Fig. 1, showing a modified form of part of the invention. Fig. 6 shows a blank from which one of the details of the invention is formed.

The invention is not limited to the particular form and construction here shown and described; but the embodiment here represented serves to illustrate the best form in which I at present contemplate constructing the invention. In this form tape is supplied from a roll of previously-prepared gummed and dried paper and is arranged with its forward end projecting from the case, as indicated at B in Fig. 1. When needed for use, the tape is drawn forth and in so doing is moistened, and thus rendered

adhesive, and is cut off, leaving an end projecting for future use, and the moistening operation is stopped.

Referring to the drawings, the various parts of the machine are represented as supported by an inclosing frame, composed of parts 1 and 2, which are joined together at the vertical hinge 3 at the rear. The line of separation preferably occurs in the middle, as plainly shown in Figs. 2 and 3; but all the working parts are mounted in the portion 1, and the view shown in Fig. 1 indicates the appearance with the portion 2 of the frame removed. The frame is supported by legs 4.

5 is the supply of tape, shown in the form of a roll mounted on a tubular core 6. One feature of novelty is the manner of supporting this roll pivotally. Flange-like disks 7 7 are provided with spring-fingers 8 9, as shown clearly in Fig. 3, adapted to engage frictionally the interior of the tube, the spring-prongs pressing outward. These disks are perforated centrally with holes of a suitable size to turn easily upon a pivot 11. The disks may conveniently be formed by stamping in the blank form shown in Fig. 6, afterward bending the prongs to the shape shown in Fig. 3. When put in place, the prongs 8 of one disk are arranged quartering with the prongs 9 of the disk on the opposite side. A screw 10 at the end of the pivot 11 holds in place a flat spring 12, which bears against the end of the roll, pushing the same against radial ribs 14 with whatever tension is caused by adjustment of screw 10. The feature thus described makes it possible to fix this spring in proper adjustment for a successive number of supply-rolls of tape. To renew the supply-roll, the spring is slipped upward and off, the screw-head 10 passing through the enlargement 13 in the central slot of the spring. The tubular core and its flange-disks 7 7 may then be slipped off, the disks placed in a fresh coil and replaced, and the spring slipped back into position, when the tension will be precisely the same as before, provided no change is made in the screw 10. In previous forms of the device in which solid cores have been used it has sometimes been necessary to readjust the spring at each time a new roll is substituted, owing to the impossibility under commercial conditions of procuring solid cores of uniform length. The outward spring of the prongs 8 9 makes them

adjustable to fit any ordinary variations in diameter of tubular cores, thus enabling the entire roll to turn easily upon the pivot 11.

The moistening device comprises a pan 16, resting on posts 17, projecting from the side frame 1, and a roller 18, partly immersed in water in the pan, having a surface covered with absorbent material or otherwise prepared for conveying water as the roll rotates upon its pivot 19. A closed reservoir 22 is supported on posts 23 and has a depending neck 24 with an opening in the pan which is normally sealed by the water contained in the pan. When the level of this water falls sufficiently, air enters and allows more water to descend from reservoir 22. The wall of the pan next to the frame is extended sufficiently to support two guide pins or rolls 27 and 28 at the end nearest the supply-roll of tape and a guide-pin 29 and another 30, placed approximately vertically over it near the moistening-roll. Another guide-roll 31 is supported by a projection 32 on the back wall of the pan and is located outside the moistening-wheel and above it in such position in relation to the guide-pin 30 that a straight line tangent to the upper side of pin 30 and the under side of pin 31 will intersect the moistening-roll 18. Under the pin 31 is a tab-carriage 33. The tape coming from the supply-roll goes between pins 27 and 28, forward under 29, back between 29 and 30, and forward over 30, over 18, and out at the forward end of the machine between 31 and the tab-carriage 33. It is the purpose to employ in this apparatus tape having some degree of elasticity. This may conveniently be obtained by using suitable paper tape having one side covered with dry gum adhesive matter. When such a tape is threaded through the path indicated and its outer end is left free, it will assume substantially the shape indicated by the line B in Fig. 1, the reversed curve between pins 29 and 30 throwing the tape upward, so that it passes moistening-roll 18 without contact, the tab end resting on its carriage 33. When the tape is drawn forth, it tends to assume a straight line and inevitably comes in contact with the moistening-wheel, because in its highest position C, which is determined by the position of the guide-pin 31, the straight line between 30 and 31, which the tape tends to occupy, is intersected by the curve of the moistening-roll.

In the development of this art heretofore accomplished an external guide for the tape has been devised, consisting of a bar located at about the position occupied by the tab-carriage 33 in the present drawings, which bar was mounted upon a frame which allowed it to yield in a downward direction when the tape was drawn down and which was automatically returned to said position, thus moving the tab end away from the moisten-

ing-wheel when the tension was released. In another stage of development a multiple-ridged roll was used as a tab-support, this being an improvement and different in function, in that in the latter apparatus the removal of the tape from the moistening-wheel was effected either by the act of the operator lifting the same with his hand or by the spring of the tape automatically from passing around pins 29 and 30. The present tab-carriage is allied to this latter form of apparatus and is an improvement thereon. The function of the carriage is to provide a support for the tab end movable forward and back in a horizontal direction. The carriage has no relation to the moistening-wheel so far as the removal of the tape therefrom is concerned. When the tape is being drawn forth, all forward of the moistening-wheel is in an adhesive condition. In the operation of severing the tape is raised to the position marked D, and the severing occurs at the point shown by the dotted position of the knife 42. The tape is at that instant stretched between pins 30 and 31, in contact with wheel 18 and not in contact with carriage 33, being raised above the same against the under side of pin 31.

The carriage 33 is shown enlarged in Fig. 4 and consists of a horizontal serrated bar which forms the tape-support, two pivots mounted in projections 32 34 from the pan, and a weighted portion 35, which maintains the serrated bar normally under the roll 31, but permits it to swing a little forward or back of the same, motion being limited in these respects by the stop 37. Normally when not in contact with the tape the carriage assumes a position of rest with the serrated bar somewhat forward of the position shown in Figs. 1 and 4. When a tab end of the tape falls from the position D after severing, its under side strikes the carriage 33 and adheres slightly thereto, and owing to its elastic character the tape at the same instant automatically lifts itself from the moistening-wheel 18 to the curved position indicated by the line B. In so doing the tab end is withdrawn somewhat into the apparatus. The purpose of the carriage 33 is to render the apparatus more delicately responsive when tape of weak elastic power is used. If a stationary rod be substituted for the carriage 33, the tape will in general be drawn back in a normal way; but if the elastic power be weak it will be overcome by the strength of the adhesion to this stationary rod. The substitution of the carriage 33 for a stationary rod enables the tab to be withdrawn without fail, notwithstanding that the elasticity of the tape is too weak to overcome the adhesion of the tab to the support 33. This is accomplished by the yielding motion of the support, which moves inward with the tape. The essential principle of

this device, therefore, is that of a carriage which has a slight but free movement backward and forward in order to allow the elasticity of the tape to have full play. If the tape is drawn outward at a lower angle than the line C, the carriage swings outward a little till stopped by the stop 37, thus permitting the tape to pass over it without having the adhesive materials scraped away by the carriage. The forward and back movement of this carriage may be obtained in any other suitable way, but the device of causing the same to swing has the advantage of being simple and free from friction.

Another feature of the invention is the compensating spring 39, which is conveniently attached at some point forward of the rear surface of the moistening-wheel 18, as at 38, on the support 34 and which has an arm (shown in dotted lines in Fig. 2) bearing on the rear surface of the wheel 18. This serves in part the function of scraping excess of moisture from the wheel, but mainly it serves to compensate the irregularities of motion of the moistening-wheel as tape is drawn forth. This spring yields upward approximately in the direction of motion of the surface of the wheel 18; but it will be observed that its point of attachment 38 is not concentric with the wheel, and that as it moves upward its path departs from the surface of the wheel, so that its drag on the wheel becomes weaker. In operation this spring modifies the motion of the wheel, retarding it somewhat and at the same time giving it a somewhat jerky irregular movement, which facilitates the moistening operation where the wheel is in contact with the tape.

Another feature of the invention relates to the severing-blade 42, which is mounted pivotally at 41 and has an arm 40 projecting in such manner that it is in position to be engaged by the tape when the latter is raised from position C to position D. The pivotal mounting of the blade comprises a safety device, and if any person or object should touch the blade from the front the blade swings easily backward and does no damage. When, however, the tape is raised and approaches the position D, it engages this part of the apparatus on both sides of the pivot 41. Hence the pressure of the tape upon the V-shaped point of the blade 42 cannot swing that blade backward, and the blade pierces the tape, being held to its work by contact of the lower portion of the tape with the arm 40. A weight 44 may be provided to maintain the blade and arm normally in the desired position, and a stop 46 can be used to prevent the arm from swinging too far back; but the latter is not necessary. The device is arranged in Fig. 1 to serve still another function, viz: the contact of tape with the arm 40 not only prevents blade 42 from retreating, but actually throws it forward, as is evident from

consideration of the dotted-line position of the blade to which it is thrown by action of the tape against arm 40. As shown in Fig. 1, the blade is retracted entirely within the apparatus, but can project forward through slot 43.

The invention also comprises means to guard against injuring the package by the blade while in the act of severing the tape. For that purpose the frame of the apparatus projects forward at each side of the knife in a curve, (indicated at 47,) the space between which is free for passage of tape; but these side projections prevent the package from approaching the knife. In operation the package is held in the hand with the tape attached and is moved upward, resting on the curve 47, which thus gages its distance and limits its approach to the blade. Another form of this feature of the invention is shown in Fig. 5, in which the blade 42' is pivoted at 41' and is capable of swinging outward through slot 43'. Instead of the rigid projecting portion 47 a pivoted portion 47' is substituted, pivoted at 52, having a notch at its extremity in which the package A may be rested, as illustrated. Upon pushing the package A upward, the carriage 47' will swing around the pivot 52, and the tape will encounter the tail of the knife under the pivot 41', thus forcing forward the blade 42', which will pierce and sever the tape at a short distance from the package A. While this is the preferred form, the action may be made more positive if desired by connecting levers between the swinging part 47' and the swinging knife, so that the knife shall be swung by the direct push of the operator in moving the lever or carriage 47' instead of indirectly by virtue of the tension of the tape against the tail of the knife, as here illustrated.

Another feature of the invention relates to the device for moistening the projecting tab end B at times when it has become dry, owing to lapse of time. It is easily possible to push the tab end B downward with the thumb upon the adjacent surface of the moistening-wheel; but the operator is apt to soil the fingers in removing the tape from the wheel when thus moistened. An auxiliary roll 50 is therefore provided contacting with the forward surface of moistening-wheel 18, mounted on an arm 51, which is concentric with wheel 18. This little auxiliary roll has a felt or other water-conveying surface, by which it may take moisture from wheel 18. To moisten the projecting tab end, this auxiliary roll is raised a short distance toward the carriage 33, thus becoming thoroughly moistened by rubbing on the surface of 18. Then the tab end is held near and the roll 50 pushed down in contact with the under side thereof. The tab end is thus moistened and rendered adhesive without sticking to any part of the moistening apparatus.

I claim—

1. A rotatable roll for rendering tape adhesive, in combination with a drag-bearing thereon, comprising a spring-rod having one end fixed in position eccentrically to the roll on the side toward which motion normally proceeds, and the other end bearing against the periphery.
2. A rotatable roll for rendering tape adhesive, in combination with a spring drag-bearing thereon, the spring being arranged to act approximately in a tangential direction.
3. A device for rendering tape adhesive, in combination with a carriage located in the subsequent path of the tape, movable backward and forward in the direction of travel of the tape, for retractably supporting the tab end of tape.
4. A device for rendering tape adhesive, in combination with a blade for severing the tape; and means for guiding the package attached to the tape past the blade during the severing operation at a predetermined distance therefrom.
5. A device for rendering tape adhesive, in combination with a blade for severing the tape; and stationary guards set adjacent to the ends of the blade's edge, projecting before the same and obstructing the approach thereto.
6. Means for guiding a strip of tape, in combination with a lever, having at one end a severing-blade for tape and having its other end in position to be engaged by the tape when the latter approaches the blade, thereby holding the blade against retraction.

7. Means for guiding a strip of tape, in combination with a lever, having at one end a severing-blade normally retracted within the apparatus and having its other end normally in position to be engaged and retracted by the tape on its approach to the blade, thereby projecting the blade.

8. Means for guiding a strip of tape; a roll contacting with the guided tape to render the tape adhesive, in combination with a small auxiliary roll revoluble about the axis of the first roll and contacting with its surface beyond the point of guided contact of tape therewith, whereby the projecting tab end may be rendered adhesive.

9. A severing-blade, movably mounted; in combination with a reversely-moving arm controlling the blade's movement, said arm being engaged and operated by approach of the tape toward the blade for severing.

10. An apparatus for furnishing adhesive tape, having a pivotal support for a supply-roll, in combination with rotatable disks thereon embracing opposite sides of the roll, having radially-expansive spring-prongs projecting approximately parallel to the pivot for engaging interiorly the tubular core of a roll of tape.

In testimony whereof I have affixed my signature in presence of two witnesses.

CLARENCE B. FROST.

Witnesses:

EVERETT E. KENT,
M. E. MURPHY.