J. D. McLAURIN.

BOX STAYING MACHINE.

APPLICATION FILED MAY 22, 1912.

1,198,564.

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Fig. 1

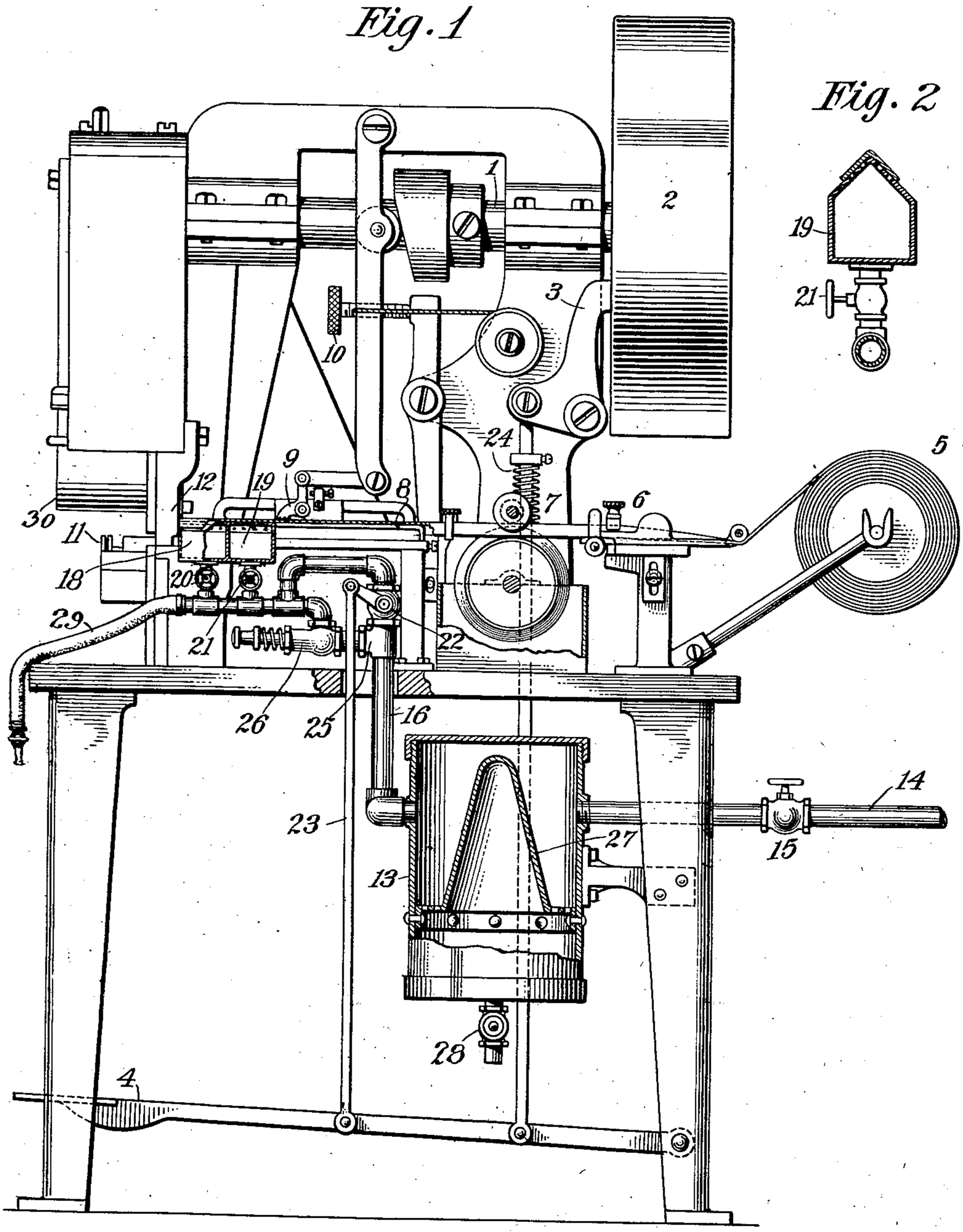


Fig. 2

Witnesses:

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UNITED STATES PATENT OFFICE.

JAMES D. McLAURIN, OF NEW YORK, N. Y., ASSIGNOR TO NATIONAL BINDING MACHINE COMPANY, A CORPORATION OF NEW YORK.

BOX-STAYING MACHINE.

1,198,564. Specification of Letters Patent. Patented Sept. 19, 1916.

Application filed May 22, 1912. Serial No. 698,988.

To all whom it may concern:

Be it known that I, JAMES D. McLAURIN, a subject of the King of Great Britain, residing at New York city, New York, have invented certain new and useful Improvements in Box-Staying Machines, of which the following is a specification.

This invention relates to box staying machines and particularly to that type of machine disclosed in U. S. Patent No. 557401 granted March 26, 1896 to Mark D. Knowlton.

One object of the invention is to provide in a machine of the class described, an improved mechanism for softening and moistening the gum on the stay strip which the machine applies to the corners of the boxes. In the machine as disclosed in the said patent and as extensively used in practice the stay strip is moistened by being drawn between a pair of rollers, the one which engages the gummed side of the strip running in a pan of water. Experience has demonstrated that this type of moistener is a frequent source of trouble and requires constant attention to operate satisfactorily. In the first place the pressure of the roller which holds the strip against the moistening roller must be carefully adjusted for if the pressure is not sufficient the gum will not take up enough water to render it sufficiently adhesive whereas if the pressure is too great the gum will adhere to the moistening roller spoiling the strip and also clogging the machine. Further, it is well known that when gum is moistened with water it requires an appreciable time to soak in before it will stick to the box blank and hence the moistening rollers have to be arranged at some distance from the stay applying mechanism and the feed mechanism, which must be arranged more or less closely adjacent the stay applying devices, is therefore obliged to operate on the freshly moistened tape. The feed mechanism is designed to engage as little as possible of the area of the gummed side of the strip but nevertheless, becomes frequently clogged with gum so that considerable time is lost in cleaning the machine. Experience has also shown that should a little oil from the bearings of the machine get on the gummed surface of the strip or in the water of the moistening roller tank the moistening effect of the water is almost nullified. To remedy these defects I provide the machine with means for directing a blast of steam against the gummed surface of the strip and so construct and arrange the parts that the steam outlet is immediately adjacent the anvil of the strip applying mechanism as I have found by much experiment that a properly regulated blast of live steam due to its heat and penetration will render a gummed surface properly adhesive for immediate use and will effect its purpose even though there be oil on the surface of the gum.

In the accompanying drawings I have illustrated a preferred application of my steaming attachment to a box staying machine of the type mentioned and as there shown my invention comprises various novel features of construction which will be hereinafter described but it is to be understood that my invention is not restricted to such details of construction except in so far as limited by the appended claims.

In the said drawings: Figure 1 is a side elevation partly in section of a box staying machine equipped with my improved moistening mechanism for the staying machine; Fig. 2 is a transverse vertical section through the steam moistening device.

I will first describe the principal parts of the stay attaching machine so that the coöperation of my improved moistening mechanism therewith may be clearly understood, and in the said drawings, in which like reference characters indicate like parts throughout the several views, 1 indicates the main shaft of the machine which is driven from a pulley, 2, by means of a clutch (not shown) but controlled by stop 3. The clutch is of the well known "one-revolution" type and when released by the attendant through the operation of the treadle 4 the shaft 1 is rotated through one complete revolution and the parts of the machine given one complete cycle of operations.

The reel of tape 5 is mounted on a suitable bracket at one side of the machine, and from the reel the tape passes through the creaser 6, thence between the rollers 7 of the old moistening device which also assist in creasing the tape. In front of the rollers, the feed mechanism is arranged, which as shown comprises a guide rod 8 for the tape and a reciprocating "gripper" feed member 9 actuated by a cam on the

shaft 1 and provided with a screw 10 by which the length of the feed stroke may be regulated. At the front of the machine is arranged the anvil 11 over which the box is placed by the attendant and over the anvil, in the housing 12, the cutter and a plunger 30 for the tape are mounted and connected to the shaft 1 for suitable timed operation so that at each revolution of the shaft 1 a piece of suitable length is cut from the strip of tape and attached to the meeting edges of the box blank held in position on the anvil by the attendant.

To provide the steam for moistening the gummed strip, I preferably mount a steam chest 13 suitably supported on the frame of the machine beneath the bed thereof. Leading into the chest from a boiler or other source of steam supply, not shown, is a pipe 14 having a cut-off valve 15 and connected to the opposite side of the chest is a delivery pipe 16 having a vertical portion which passes upwardly through a hole in the bed of the machine and a horizontal portion extending toward the front of the machine. Mounted on the bed of the machine between the end of the guide rod 8 of the feeding mechanism and the housing of the cutter is steam box having its upper side perforated as shown and preferably of an inverted V-shape, corresponding with the cross section of the creased tape. The steam box is divided into two separate compartments 18 and 19 each of which is connected to the horizontal portion of the pipe 15 by a separate branch pipe. The branch pipes are provided with cut-off valves 20 and 21 respectively so that either or both compartments of the box may be used as desired.

To control the admission of the steam to the compartments of the box, I provide a valve 22 in the vertical branch of the box, which valve is connected by a link 23 with the treadle 4 so as to be opened each time the treadle is depressed to set the machine in motion and closed by the spring 24 of the clutch stop whenever the stop releases the clutch and stops the machine. Whenever the machine is stopped for a considerable length of time the steam in the pipes will be condensed and fill the pipes with water so as to prevent the proper moistening of the strip when the machine is again started, were not some means provided to drain the pipes without setting the machine in motion. To this end I provide a by-pass pipe 25 around the valve 22 which pipe is normally closed by a hand valve 26. Before depressing the treadle 4 to start the machine the attendant opens the valve 26 and allows the water in the compartments 18 and 19 to drain into the chest 13 which, as shown, is provided with a perforated diaphragm 27 so that the water may collect in the bottom portion thereof whence it may be drawn off from time to time through a valve 28 provided for the purpose.

When the strip is pressed against the box blank some of the gum may be pressed out beyond the edges of the strip and this gum accumulates on the anvil and presser, unless removed, and in time interferes with the proper operation of the parts. I have found that steam is a most effective agent for removing this accumulation and to provide for its convenient use for this purpose I attach to the end of the pipe 16 a flexible hose 29 having a suitable valve so that the attendant may direct the steam against the gummed parts whenever it may be necessary.

In operation the feed mechanism is adjusted by means of the screw 10 to correspond with the depth of the boxes to be stayed and if the boxes are comparatively shallow the valve 21 in the pipe leading to the rear compartment 19 of the steam box is shut so that the steam can escape only through the perforations in the top of the front compartment 18. The pipes are then drained in the manner described and the valve 15 opened to permit steam to enter the chest 13. The attendant next places a box over the anvil 11 and depresses the treadle 4, thereby starting the machine and opening the valve 22 so that a blast of steam is directed against the gummed surface of the stay strip as it is advanced by the feed mechanism over the compartment 18 of the steam box and thence over the anvil. When the feed gripper reaches the end of its forward movement the knife and presser are actuated to cut off the freshly moistened portion of the stay strip and apply it to the corner of the box blank. At the end of each staying operation the treadle is released, thereby stopping the machine and closing the valve 22.

If the boxes to be stayed are comparatively deep both valves 20 and 21 are opened to increase the steam-outlet so as to provide sufficient steam to moisten the increased length of tape fed at each operation of the machine.

When the machine is equipped with my improved moistener the rollers 7 may be dispensed with, but I prefer to leave the rollers on the machine for the reason that, as stated above, they assist in the creasing of the tape and also so that in case the steam supply should fail for any reason the tank can be filled with water and the machine used in the ordinary manner until steam is again available.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a box staying machine, the combina-

tion of means for feeding a stay strip, means for applying said strip to a box, a steam pipe having an opening adjacent the path of movement of said strip, a valve in said pipe for controlling the passage of steam through said pipe, means for operating said valve in synchronism with the operation of said applying means and a by-pass around said valve provided with means for opening and closing the same.

2. In a box staying machine, the combination of means for feeding a stay strip, means for applying said strip to a box, a steam pipe having an opening adjacent the path of movement of said strip, a valve for controlling the passage of steam through said pipe and means for varying the effective area of said opening.

3. In a box staying machine the combination of means for feeding a stay strip, means for applying said strip to a box, a steam pipe having an opening adjacent the path of movement of said strip and a valve for controlling the passage of steam through said pipe, said pipe having a branch whereby steam therefrom may be directed against said strip applying means to clean the same.

4. In a machine of the character described, the combination of means for feeding a gummed strip, means for applying said strip to an article, means for operating said feeding and applying means, a valve for controlling a blast of steam directed against the gummed surface of the strip, and means whereby said valve and said strip feeding means may be actuated simultaneously.

5. In a box staying machine, the combination of means for feeding a staying strip, means for applying the strip to a box, a steam pipe having an opening adjacent the path of movement of said strip, a valve in said steam pipe, and means connected with the strip feeding means and said valve to actuate them simultaneously.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses, this 27th day of April, 1912.

JAMES D. McLAURIN.

Witnesses:
JOHN A. MORISON,
W. B. MORTON.