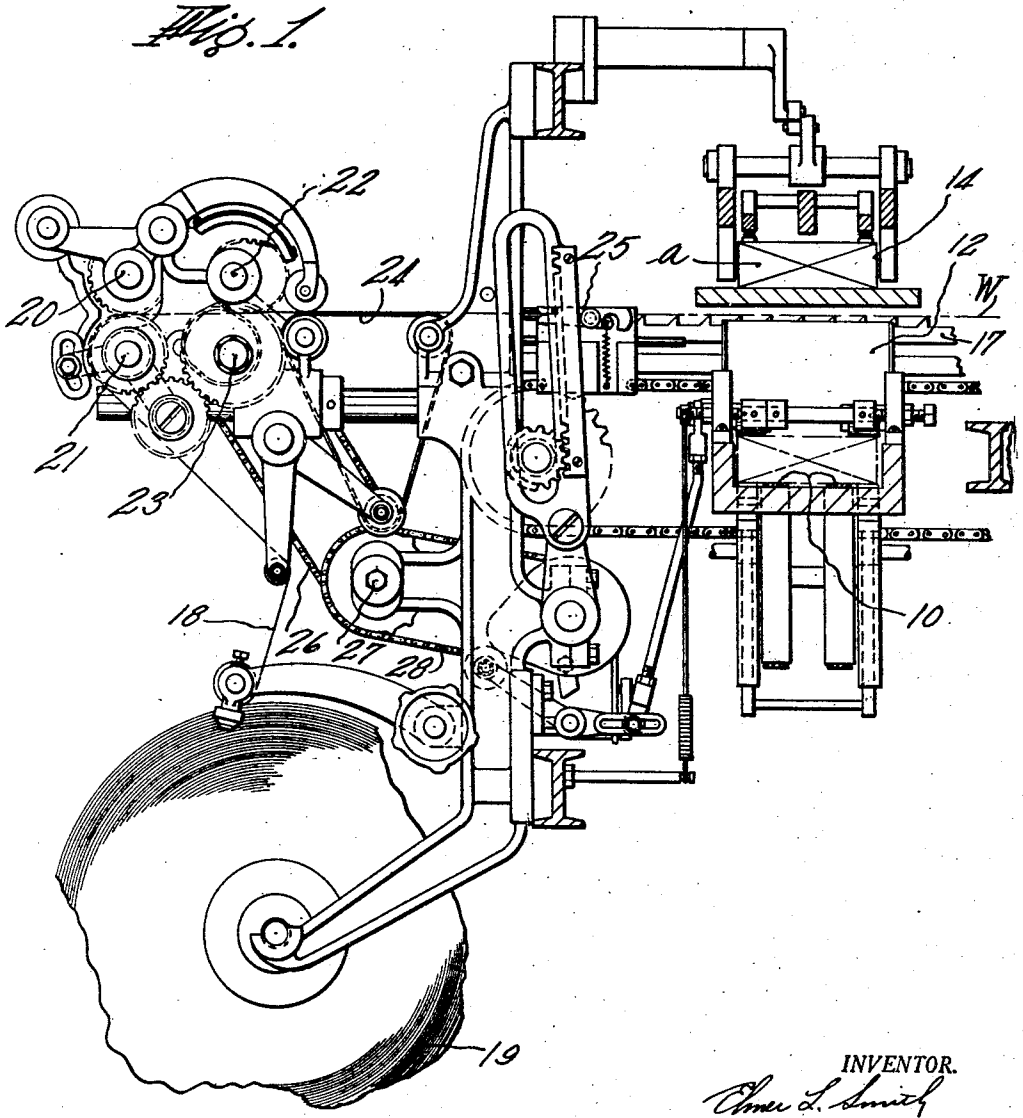
Aug. 29, 1933. E. L. SMITH 1,924,964

WRAPPING MACHINE

Original Filed Sept. 27, 1928 4 Sheets-Sheet 1

Fig. 1.

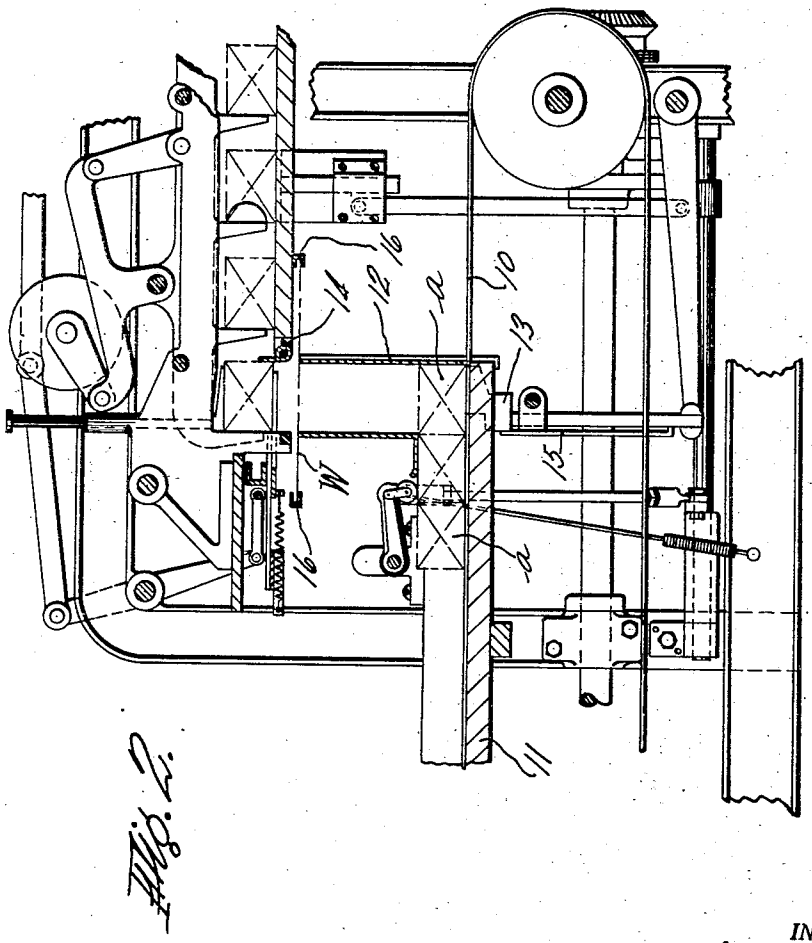


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Fig. 6.

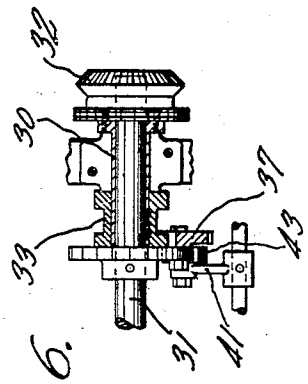


Fig. 4.

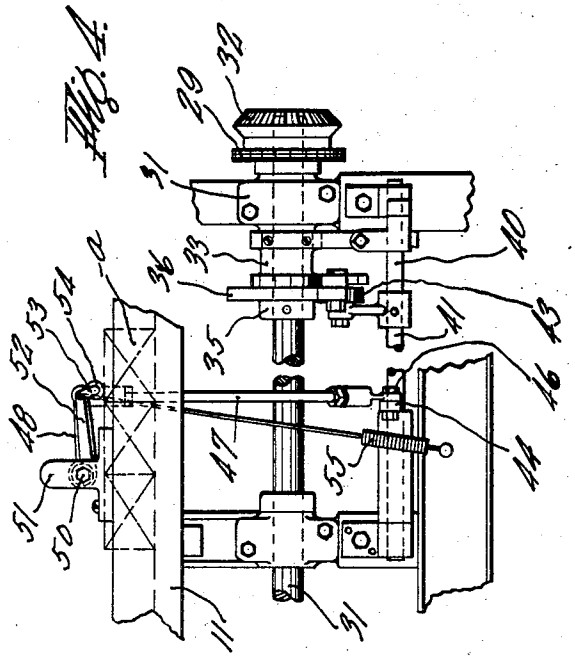


Fig. 5.

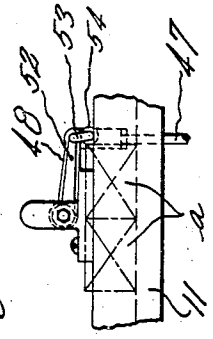
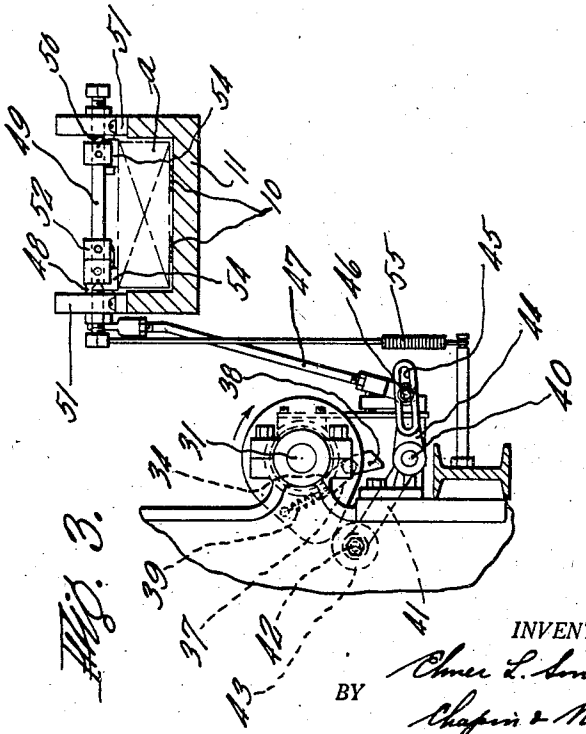


Fig. 3.



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Fig. 7.

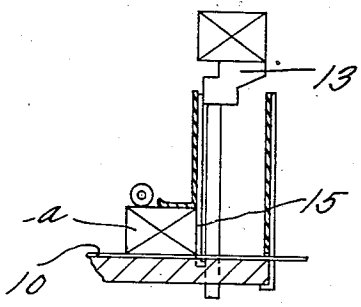


Fig. 8.

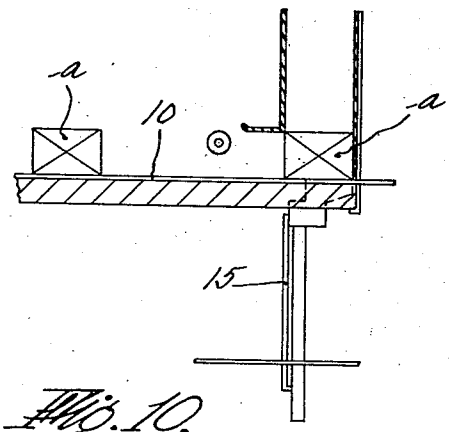


Fig. 9.

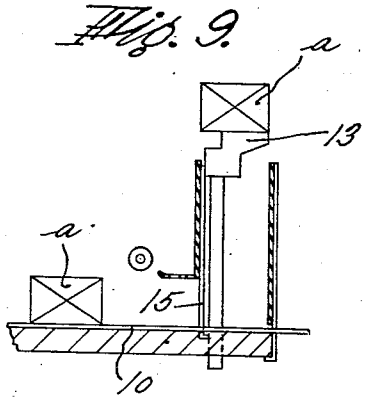


Fig. 10.

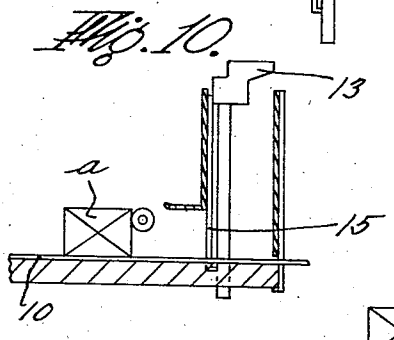


Fig. 11.

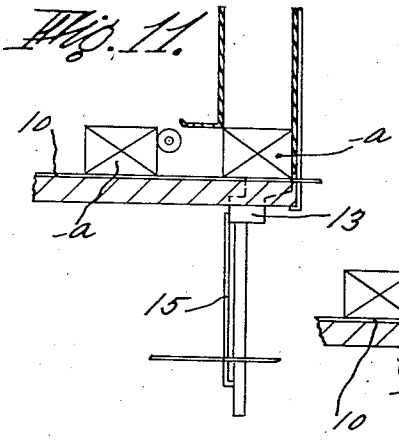


Fig. 12.

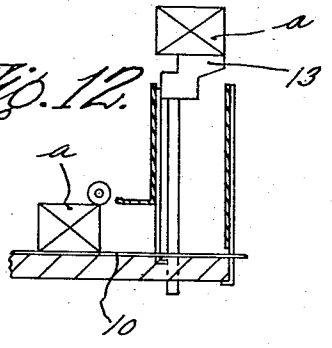
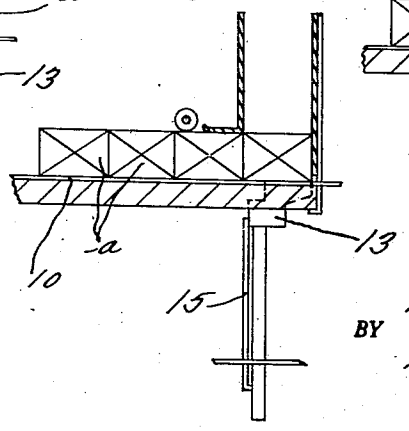


Fig. 13.



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1,924,964

UNITED STATES PATENT OFFICE

1,924,964

WRAPPING MACHINE

Elmer L. Smith, Longmeadow, Mass., assignor to Package Machinery Company, Springfield, Mass., a corporation of Massachusetts

Application September 27, 1928, Serial No. 308,800. Renewed November 11, 1931

5 Claims. (Cl. 93—2)

My invention relates to mechanism for controlling the delivery of articles to be wrapped and of the wrapping material into a wrapping machine which may be of any desired type. In the drawings, the wrapping machine has been shown as of the type described in the patent to Smith et al, No. 1,575,723, dated March 9, 1926.

One object of the invention is to provide a simple mechanism for preventing the feeding of an article into the machine in incorrect timed relation to the mechanism thereof. A further object is to provide a simple mechanism for preventing the feeding of a wrapper into the machine if no article is in place to receive it. A further object is to provide a simple and compact mechanism controlling both the article and the wrapper with a single operation and with a single article-contacting device. Other objects will appear from the following description and claims.

Referring to the drawings:

Fig. 1 is a section through a wrapping machine of the type shown in Patent 1,575,723, illustrating a paper feed attached thereto;

Fig. 2 is a partial longitudinal section through the wrapping machine with the device of my invention in place, corresponding generally to Fig. 19 of Patent 1,575,723, but omitting parts not necessary for an understanding of the present invention;

Fig. 3 is a detail view of parts shown in Fig. 1;

Fig. 4 is a side elevation thereof;

Fig. 5 is a partial view similar to Fig. 4 but showing the parts in a different position of operation;

Fig. 6 is a longitudinal section through parts shown in Fig. 4;

Figs. 7 to 10, inclusive, are diagrammatic views showing the manner in which the device operates when the articles fed into it are spaced more than a predetermined distance;

Figs. 11 and 12 are similar views showing the operation when the articles are somewhat more closely spaced; and

Fig. 13 is a similar view showing the action of the device when the articles are fed to it in continuously abutting succession.

In the type of wrapping machine to which my invention has been shown as applied, the articles *a* are placed upon continuously moving belts 10 (Fig. 2) passing over a support 11. The end wall 12 of a vertical passageway forms an abutment limiting the movement of the articles along the belts. An elevator 13, made in two parts so as to straddle the belts, is operated periodically by mechanism described in Patent 1,575,723 to engage the bottom of the foremost article adjacent it ends and to lift it into a wrapping channel 14, the details of which are described in said Patent 1,575,723 and therefore need not be repeated here. When the elevator is raised, a plate 15 carried by it acts as a temporary abutment preventing advance of the articles along the conveyor until the elevator is lowered.

A wrapper W is delivered by suitable feeding means onto supports 16 and 17 positioned to hold the wrapper in the path of the ascending article just prior to its entry into the wrapping channel 14. Details of the wrapper feed will be found in the patent to Smith, No. 1,542,104, June 16, 1925, and in Patent 1,575,723. Reference is hereby made to those patents for a complete description of the wrapper feed, the several parts being touched upon here merely to show the general manner of handling the material.

A paper web 18 (Fig. 1) is supplied from a roll 19, and is led between suitably driven feed rolls, located upon shafts 20 and 21. These rolls are driven continuously to draw the web from the roll 19 and to deliver it between cutting elements carried upon shafts 22 and 23 which sever the web into sheets W. A belt 24 receives the cut wrappers from the cutters and positions them for grippers 25 which are reciprocated back and forth by mechanism fully disclosed in Patent 1,575,723 to carry the wrappers successively onto the wrapper supports 16 and 17 where they are engaged by the articles being raised by the elevator 13.

The various elements of the web feeding device are driven by a chain 26 passing around a sprocket on shaft 23, and around a second sprocket on a countershaft 27. This countershaft is in turn driven through a chain 28 passing around a sprocket 29 (Fig. 4) on a sleeve 30 (Fig. 6) freely rotatable upon a shaft 31. This shaft is continuously driven from the wrapping machine by a gear 32.

Upon the sleeve 30 is secured a clutch member 33 having at one point in its periphery a notch 34 (Fig. 3). Adjacent the clutch member, a hub 35 is fixed to the shaft 31 and bears a flange 36 formed as a cam. A pawl 37, having an outstanding tail portion 38, is pivoted to the flange 36, being normally urged by a spring 39 into the notch in the clutch member. Fixed to a shaft 40, which is suitably rotatable in the machine frame, is an arm 41 bearing concentrically at its end a pin 42 and a cam roll 43. The cam roll is designed to ride on the outer periphery of the cam flange 36, while the pin 42 projects therefrom into the

path of the tail 38 of the pawl except when kept radially beyond the pawl by mechanism to be described.

Also fixed to the shaft 40 is an arm 44 provided with a slot 45 accommodating an adjustable pivot 46. This pivot is connected by a link 47 with an offset arm 48 fixed to a shaft 49 which is pivoted at 50 to brackets 51 affixed to the conveyor support 11. A pair of arms 52, also fixed upon the shaft 49, have downwardly projecting extensions 53 at their ends which bear rolls 54 adapted either to ride upon the top of the packages *a* on the conveyor 10 or to lie in front of a package and prevent its movement, depending upon the condition of operation of the machine. A spring 55 urges the rolls downwardly, and also urges the cam roll 43 towards its cam.

The normal position of the rolls 54 during the greater part of the machine cycle is in the path of an advancing package as indicated in Fig. 11. Periodically during the cycle, the rolls are raised by reason of the high part of cam 36 contacting with the cam roll 43. This raising of the roll (Fig. 12) occurs at a time when the elevator 13 is up and the plate 15 blocks the passage along the conveyor of the released package. The package arrives at the plate during the descent of the elevator, and is in readiness to ride onto the elevator top as soon as the latter has been lowered sufficiently. By preventing the approach of a package to the elevator except when the latter is in proper position, all danger of the package being incompletely seated on the elevator when the latter rises is avoided.

The rolls 54 and the attendant mechanism perform one additional function, that of controlling the operation of the paper feed so that no paper will be delivered to the wrapping mechanism unless there is a package present to receive it. When the cam 36 permits the roll 43 to move inwardly, the pin 42 is brought within range of the tail of pawl 37, throwing the pawl out of engagement with the notch 34 on the sleeve 31, which as above described drives the paper feed. If a package is present under the rolls 54, as in Fig. 7, the motion of the rolls and the mechanism connected thereto will be prevented, and instead of following the contour of its cam the roll 43 will be held with its concentric pin 42 out of the path of the pawl. The paper feed will in this case continue to operate.

The spacing of the rolls 54 from the end wall 12, which it will be remembered serves as a stop limiting the travel of the articles along the conveyor 10 and operates to position the foremost article over the elevator 13, is such that when the rolls are raised the conveyor will carry the article against the plate 15 before the latter has descended sufficiently to permit the passage of the article over the elevator. There are thus in effect three points of temporary stoppage of the article in its passage along the conveyor. The first is against the rolls 54, the second against the plate 15, and the final one against the end wall 12. The first position may be passed without stoppage if the rolls are in their elevated position when the article arrives beneath them, or, of course, if there is a continuous stream of articles as shown in Fig. 13. The second might be passed were the plate to be lowered below the conveyor level at the same time that the article reaches it, but it is preferable to have a slight stoppage of the article by the plate 15 in order to insure that the maximum time possible is provided for the article to be carried over the elevator by the conveyor. The third stoppage is of course positive under all conditions.

The rolls 54 thus perform a double function. In the first place they prevent an article reaching the top of the elevator too long after the plate 15 is lowered, so that the article would not be wholly centralized upon the elevator at the time the latter starts to rise. Were this condition to occur, the article would be crushed. In the second place they prevent the feeding of paper unless there is an article in the machine properly positioned to be wrapped. With respect to the first function the rolls cooperate with the plate 15, the rolls holding back packages which arrive singly in improperly timed relation, and the plate 15 holding back a continuous line of packages and preventing too early entrance of a package into the space above the conveyor. The rolls 54 are spaced from the abutment 12 a distance dependent upon the speed of the conveyor belt and on the timing of the wrapper feed. They can in general be placed either so that a released article will travel all the way to the back plate 12 during one cycle or so that the article will reach only the plate 15 on this cycle and the back plate on the next cycle, but preferably the latter.

What I claim is:

1. In a wrapping machine, a continuously moving article feeding belt conveyor, a reciprocating plunger operable to remove articles from said conveyor, said plunger having an abutment positioned by article feeding movement of the plunger to prevent movement of articles along the conveyor while the plunger is engaged in said feeding movement, and a member whose normal position is in the path of movement of articles upon the conveyor movable in timed relation to the plunger to release a held-back article only at a time when said article will not be incompletely positioned in line with the plunger by the conveyor before the plunger starts its article feeding movement, said member being yieldably mounted so as not to interfere with the passage of a continuous or properly timed succession of articles along the conveyor.

2. In a wrapping machine, a continuously moving article feeding belt conveyor, a reciprocating plunger operable to remove articles from said conveyor, said plunger having an abutment positioned by article feeding movement of the plunger to prevent movement of articles along the conveyor while the plunger is engaged in said feeding movement, means for feeding wrapping material to the machine, and a yieldable member whose normal position is in the path of movement of articles upon the conveyor movable in timed relation to the plunger to release a held-back article at a time when said article will not be incompletely positioned in line with the plunger by the conveyor before the plunger starts its article feeding movement, said member being also movable in timed relation to the wrapper feed to a position in the path of the articles unless such motion is restrained by the presence of an article, and connections between the wrapper feed and said member whereby the unrestrained return of the member into the path of the articles will cause stoppage of the wrapper feed.

3. In a wrapping machine, article wrapping instrumentalities, an article conveyor, means for shifting the articles successively from the conveyor to said instrumentalities, means for feeding wrapping material into the path of said ar-

ticles, a yielding member normally urged into the path of articles on the conveyor to restrain the passage of articles, and movable periodically and temporarily out of such path to release a held-back article in predetermined timed relation to the movement of the article shifting means, and connections between the wrapping material feeding means and said member whereby the unrestrained return of the member into the path of the articles will cause stoppage of the wrapper feed.

4. In a wrapping machine, article wrapping instrumentalities, means for feeding articles to said instrumentalities, a feeler positioned adjacent the path of articles on said feeding means, a spring yieldably urging the feeler towards articles on the feeding means, a constantly rotating shaft, a cam on the shaft, a cam roll connected to the feeler and operable by the cam to move the feeler out of the article path, a sleeve on the shaft, a paper feeding device, driving connections between the sleeve and the paper feeding device, a clutch member on the sleeve, a cooperating clutch member on the shaft, and means movable with the cam roll for engaging one of said clutch members and disconnecting the clutch when the roll is permitted by the absence of an article to follow the contour of the cam.

5. In a wrapping machine, article wrapping instrumentalities, means for feeding articles to said instrumentalities, means for feeding wrappers to said instrumentalities, driving mechanism, a feeler mounted for movement towards and away from the article path, a spring urging the feeler towards the path, a cam operating on the feeler periodically to move it away from the article path and then permitting the spring to move the feeler towards the article path, a clutch coupling the driving mechanism to the wrapper feeding means and including a releasable pawl, and a member connected to the feeler and movable thereby into position to contact with and disengage the pawl upon movement of the feeler into the article path, said member being stopped short of pawl disengaging position by contact of the feeler with an article.

ELMER L. SMITH.