Feb. 18, 1941. C. H. PETSKEYES ET AL. 2,232,558

PAPER CUTTER FOR WRAPPING MACHINES

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Fig. 2.

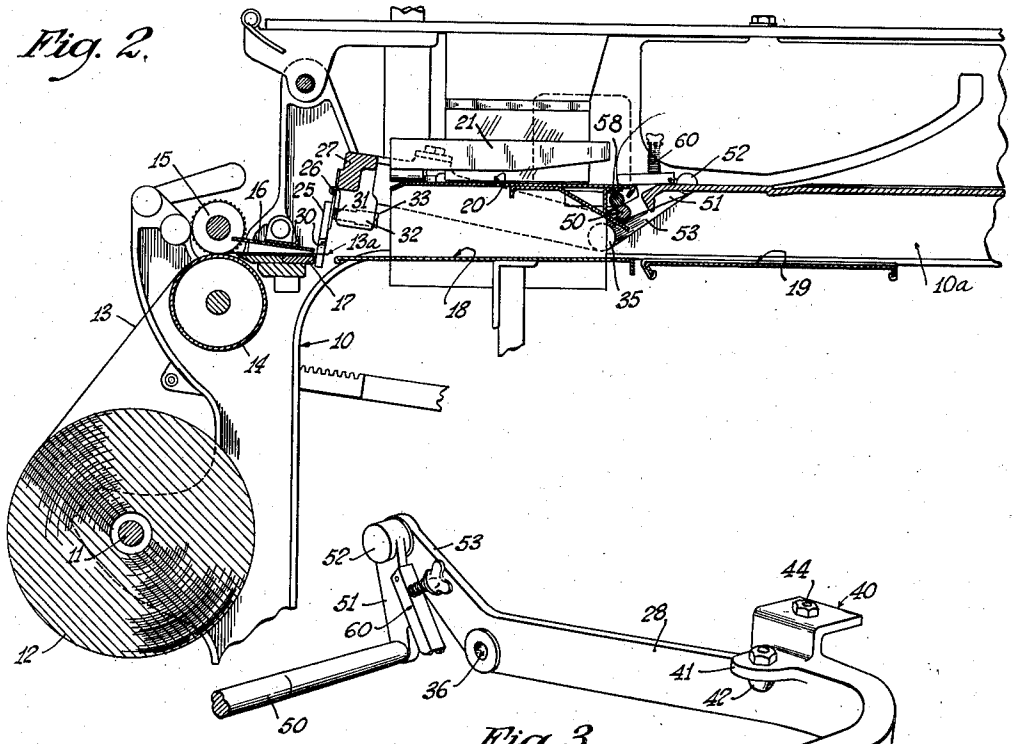


Fig. 3.

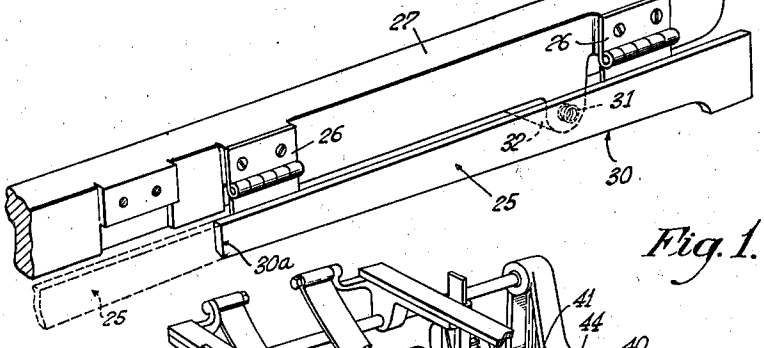
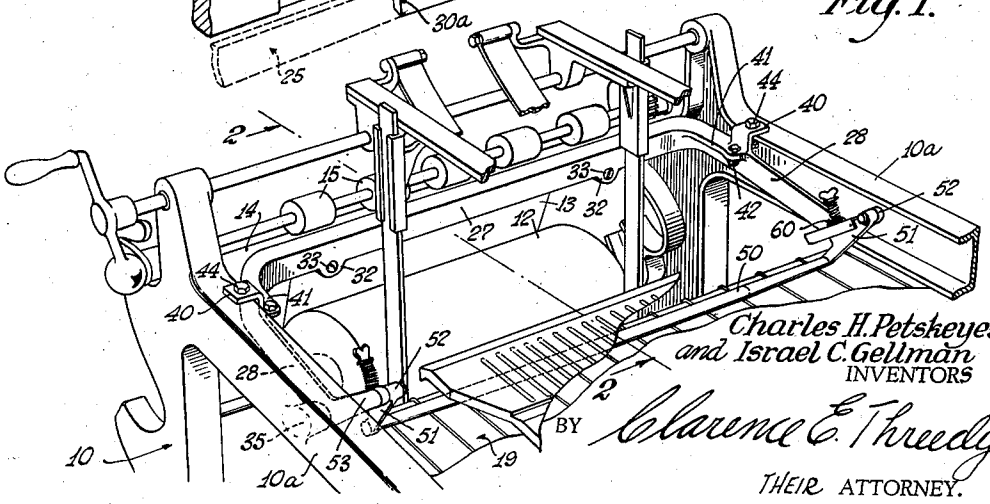


Fig. 1.



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PAPER CUTTER FOR WRAPPING MACHINES

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17 Claims. (Cl. 93—2)

This invention has as one of its principal objects the provision of improved paper severing means in a wrapping machine, said means including a knife or shear carried on a rocker arranged to be actuated by the movement of an elevator on which articles are carried during the wrapping operation.

Other objects and novel aspects of the invention relate to the form of construction, mode of operation, and arrangement of parts of the preferred embodiment described hereinafter in view of the annexed drawing, in which:

Fig. 1 is a fragmentary perspective of a wrapping machine and improved cutter therein;

Fig. 2 is a fragmentary vertical longitudinal section through the central parts of a wrapping machine; and

Fig. 3 is a fragmentary perspective of the knife frame or bail.

One form of wrapping machine in which the invention is useful is shown in Fig. 2, and includes a frame 10 on which is removably mounted a spindle 11 carrying a roll 12 of wrapping paper or webbing from which the free end portion 13 is led up over a feeding roller 14 beneath a presser roller 15, a guide apron 16, and onto a stationary shear or horizontal knife 17 which borders on the opening into which the lower level 18 of an elevator rises.

On the opposite side of the elevator opening from the stationary knife is a paper holding table 19, and the operation of the machine is such that the paper webbing 13 is fed or advanced over the stationary knife and over the elevator 18 to position its free or severed end well onto the holding table 19 while the elevator is in raised position. In this sense, the paper is fed in timed relation to the movements of the elevator, and since the latter constitutes a part of the wrapping mechanism, the paper is fed in timed relation to the operation of the wrapping mechanism.

A more detailed description of the operating and wrapping mechanism, including the wrapping functions of the elevator, will be found in our co-pending United States applications Serial Numbers 258,672, 258,673, 258,674, and 258,675.

For purposes of the present description, it is pointed out that an article to be wrapped, such as a loaf of bread, is transferred to the top or article level 20 of the elevator when the latter is lowered. Prior to this transfer, a length of wrapping paper will have been severed and suspended from one end on the holding table 19 by descent of the elevator. When the loaf of bread is transferred onto the lowered elevator, it is pushed into the hanging wrapper and hence partly wrapped. When the elevator rises, projecting portions of the partially folded paper are engaged by other wrapping instrumentalities such as the stationary arms 21 (Fig. 2) above the elevator, and the tautening means which will be described later hereinafter.

For this review, it will be understood that it is necessary to sever a length of wrapping paper from the web prior to or substantially at the moment the elevator starts to descend.

Means for severing the web includes knives 25 (Fig. 3) of elongated form (there being two identical sections 25 meeting at the point 30a) attached by hinges 26 to the bight part 27 of a rocker or bail having opposite side arms 28 (the rocker of Fig. 3 is symmetrical so that the opposite sides are identical, as shown in Fig. 1). The cutting edge 30 of the knife is arcuate or arched with a central part 30 disposed inwardly of the remaining edge portions. This facilitates a shearing as distinguished from a chopping action.

The blade 25 is urged outwardly of the rocker by springs 31 each seated in a bore formed in a boss 32 on the bight of the bail, and each tensioned by a screw 33 threaded into the corresponding boss (Figs. 1 and 2).

The knife frame, rocker, or bail is attached for rocking movement about a horizontal axis, at one end of the machine, by bolts 35 extended through bores 36 (Fig. 3) in the side arms 28 and into supporting engagement with horizontal side rails 10a of the main frame, in such position that the knife blade or shear 25 will be disposed in alignment for cooperation with the stationary shear 17 (Fig. 2).

The rocker or bail is arranged so that its bight part will rock downwardly by its own weight to move the knife 25 in shearing action past the stationary knife and sever any paper webbing 13 which lies in its path so as to leave a free or cut edge 13a along the stationary knife.

The cutting means is arranged for coaction with the wrapping means, and is provided with offset lugs 40 formed on the side arms 28 of the bail or rocker so as to project outwardly from the latter to rest upon the tops of the horizontal rails 10a of the main frame, thus limiting the downward movement of the bail, stopping it after the cut is completed.

As viewed in Fig. 3, the lug formations on the rocker include inwardly projecting ears 41 each provided with resilient or shock-absorbing bumpers 42 positioned to overlie the top part 20 of the elevator so as to be engaged by the latter in its

movement into raised position to pivot the rocker or bail upwardly to the limit of its movement, which is determined by bolts 44 loosely attached to lugs 40 and freely passing through suitable holes in the tops of rails 10a. Thus the operation of the knife or cutter is timed with and effected by a part of the wrapping means—that is, the elevator.

In the operation of the wrapping machine, the feeding roller 14 is actuated to advance the webbing across the elevator as the latter moves into raised position, at which time the knife will be raised safely out of the path of the advancing paper. The elevator rests during a definite period in raised position so that the advancing paper web has adequate time to cross over the lower level 18 of the bridge before the elevator starts down. As the elevator moves down, its support is withdrawn from beneath the knife bail and the latter drops by its own weight and shears the web.

Meanwhile, a holding bail 50 (all figures), having side arms 51 pivotally attached, as at 52, to tails or extensions 53 from the side arms 26 of the knife bail, is lowered from the position seen in Fig. 2 into the position seen in Fig. 1. As a result of downward movement of the elevator against bail member 50, action of springs 60 and the normal tendency of the bail to drop, the advanced free end of the sheet which lies on the holding table 19 is clamped against the latter so that the newly severed opposite end of the sheet may be carried down with the elevator to receive and partly wrap the next loaf.

It will be observed that the knife rocker or bail coacts with the elevator and the holding or tensioning means both of which constitute a part of the wrapping mechanism, and moreover, the knife rocker or shear bail provides a support for the holding bail, and due to the shifting of the pivotal axis of the tensioning bail as a result of the rocking of the knife bail, as well as the coaction of a spring device 60, the holding or tensioning bail is rendered quick-acting.

When the elevator returns to raised position, it will again engage the operating means 52 for the holding bail and raise the latter out of holding engagement with the table and end portion of the wrapper thereon, and, moreover, the movement of the bail will continue until it presses against the roller member or holding element 58 on the underside of the elevator table 20, as illustrated in Fig. 2. As a result, the end of the wrapper will again be held but, obviously, this time on the opposite side of roller 50 from the table, so that there will be less binding of the wrapper around the roller 58 to permit the same to yield as the loaf is pushed off the elevator.

The objects and advantages of the invention may be realized in other arrangements and forms of construction than that described in detail herein for purposes of illustration, and the invention therefore is intended to include all equivalent means fairly coming within the scope of the appended claims.

Having thus described our invention, what we claim as new and desire to protect by Letters Patent is:

1. In a wrapping machine, an article elevator, means arranged to feed a web of wrapping material across a part of said elevator in raised position, and a severing device pivotally mounted adjacent the upper position of said elevator for engagement by the latter to be raised out of severing relationship with said web when the elevator is raised, and further arranged to pivot toward said web and sever the same when said elevator is lowered away from raised position.

2. In a wrapping machine, an article elevator arranged for movement back and forth between lowered and raised position to partially enfold an article in a sheet in the path thereof, means for feeding a sheet of wrapping paper across a part of said elevator when the same is in substantially raised position and paper shearing means including an actuating part constructed and arranged for engagement by said elevator for operation of the shearing means to sever said sheet of paper responsive to lowering movement of said elevator.

3. In a wrapping machine, an elevator arranged for reciprocation between lower and upper limits, means arranged to feed a web of wrapping paper across a part of said elevator when the same is disposed in a raised position above said lower limit, and pivoted shear means mounted in the region of said upper limit for engagement and operation by said elevator responsive to movement of the latter into and out of said raised position to sever said sheet of wrapping paper when said elevator descends a predetermined distance from said raised position.

4. In a wrapping machine, an elevator arranged for movement back and forth between lowered and raised position, stationary severing means arranged adjacent said upper position of the elevator, means for feeding a web of wrapping material across said stationary severing means and across a part of said elevator in raised position, and a movable severing means mounted in the region of said upper position of the elevator for engagement and operation by the latter to be moved for shearing cooperation with said stationary severing means and sever said web when said elevator descends a predetermined distance from said raised position.

5. In a wrapping machine, an elevator arranged for movement back and forth between lowered and raised position, a stationary shear arranged opposite a part of said elevator when the latter is in raised position, means for feeding a sheet of wrapping paper in a direction past said stationary shear and over a part of said elevator, a knife bail pivotally mounted in the region of said upper position of the elevator and having portions disposed above the latter for engagement thereby when the elevator moves toward raised position to lift said bail away from said wrapping paper, shear means mounted on said bail for coaction with said stationary shear to sever said sheet of wrapping paper responsive to movement of said elevator from raised toward lowered position.

6. In a wrapping machine, a wrapping instrumentality arranged for up and down movement between lowered and raised positions, a stationary shear arranged opposite raised position of said instrumentality, means for feeding a sheet of wrapping paper relative to said stationary shear and across a part of said instrumentality when the same is in raised position and movable shear means including a shear carrying member pivotally mounted in the region of said raised position of the instrumentality and shear means mounted thereon and having parts disposed for engagement by said instrumentality responsive to movement of the latter into said raised position

to move said carrying member and said shear means mounted thereon away from said stationary shear, said carrying member being arranged and constructed to move downwardly responsive to downward movement of said wrapping instrumentality from said raised position for coaction with said stationary shear to sever said sheet of wrapping paper.

7. In combination, in a wrapping machine, an article elevator arranged for movement back and forth between lowered and raised position, a stationary shear arranged opposite a part of said elevator in its raised position, paper feeding means for advancing a sheet of wrapping paper in a direction across said stationary shear and said part of the elevator in raised position, and movable shear means including a rocker mounted in the region of said raised position of the elevator and having parts disposed in the path of said elevator for engagement by the same and pivotal movement thereby upwardly away from said stationary shear when said elevator moves toward raised position, said rocker being arranged and constructed to move toward said stationary shear when said elevator moves away from raised position, and shear means mounted on said rocker and moved into shearing relationship with said stationary shear to sever said sheet of paper when the rocker is moved toward the stationary shear in the manner aforesaid, together with means for actuating said paper feeding means and said elevator in timed cooperation.

8. In a device of the class described, a horizontal stationary shear and movable shear means including a rocker arranged for rocking movement about a horizontal axis extending substantially parallel with said stationary shear, shear means on said rocker and cooperable in shearing action with said stationary shear responsive to rocking movement of the rocker, means for feeding a sheet of wrapping paper between said shear means and beneath said rocker, and an article transfer device arranged for reciprocation toward and away from said rocker, said article transfer device being arranged to move said rocker away from said stationary shear to permit feeding of said paper between the shears as aforesaid, said rocker being arranged and constructed to move downwardly in shearing cooperation with said stationary shear by movement of said article transfer a predetermined amount away from said rocker.

9. In a wrapping machine, an elevator arranged for movement back and forth between lowered and raised position, stationary shear means arranged opposite a part of said elevator in its raised position and movable shear means including a rocker mounted for rocking movement toward and away from said stationary shear means in the region of said raised position of the elevator, and shear means mounted on said rocker for coaction with said stationary means responsive to movement of the rocker toward the same, means on said rocker engaged by said elevator in moving into raised position for movement of said rocker away from said stationary shear means, means on said rocker coacting with stationary parts of said machine for limiting the movement of the rocker in opposite directions, means for feeding wrapping paper over said stationary shear means and across said part of the elevator, said sheet being severed by said stationary and movable shear means when said elevator descends a predetermined distance, said rocker having parts arranged and constructed to provide a mounting for a movable wrapping instrumentality coacting with said elevator.

10. In a bread wrapping machine, a loaf elevator arranged for movement back and forth between lowered and raised position, a stationary shear arranged opposite a particular part of said elevator in its raised position, means for feeding a web of wrapping paper over said stationary shear and across said particular part of the elevator, a bail mounted for rocking movement about a horizontal axis in the region above said particular part of the elevator and having mounted thereon a movable shear moved toward and away from said stationary shear responsive to rocking movement of the bail, said bail having a part engaged by said elevator as the same moves into raised position to rock the bail away from said stationary shear and permit feeding of said paper web in the manner aforesaid, said bail being arranged to rock downwardly by gravity when said elevator is moved away from raised position for coaction of said shear means to sever said web, a part of the severed portion of said web being grasped by holding means forming part of said wrapping machine and coacting with said elevator, said bail having parts arranged and constructed to provide a mounting for said holding means.

11. In a wrapping machine, in combination, an article elevator movable between lowered and raised position, a knife carrying rocker mounted for rocking movement about a horizontal axis above a particular part of said elevator, means on said rocker engaged by said elevator when the latter moves into raised position to raise the rocker, said rocker being arranged and constructed to rock downwardly when said elevator moves out of engagement therewith, means for limiting the rocking movement of said rocker in opposite directions, means for feeding wrapping paper to project a free end portion thereof across said particular part of the elevator in timed relation to the movement of said elevator into raised position, knife means on said rocker arranged for coaction with stationary cutting means to sever a portion of said wrapping paper opposite said free end by downward movement of the rocker when said elevator moves away from raised position, means including a movable member coacting with said elevator in its downward movement from raised position to engage and hold said free end portion of the severed portion of the paper so that the remaining portions of said paper may be disposed in a particular wrapping position by downward movement of the elevator, said rocker having parts arranged and constructed to provide a mounting for said movable holding member.

12. In a device of the class described including a reciprocable article carrier and means for feeding wrapping material into wrapping position relative to the carrier, the combination with said carrier of cutting means including relatively movable and stationary cutters arranged for cooperation to cut said wrapping material when in wrapping position as aforesaid, means carrying said movable cutter and normally urging the same into cutting relationship relative to the other cutter and said wrapping material, said last-mentioned carrying means being mounted for engagement by said carrier for movement thereby into ineffective cutting position when the

carrier moves in one direction into a particular position, said cutter-carrying means effecting movement of the movable cutter thereon into cutting relationship with the wrapping material as aforesaid when the carrier moves in the opposite direction from said particular position.

13. In a wrapping machine, in combination, a reciprocable article carrier, a wrapper table opposite a particular position into which the carrier moves during each cycle of reciprocation, means cooperating with said carrier for feeding a web of wrapping paper crosswise of the direction of movement of the carrier onto said table when the carrier is in said particular position, and means for severing said web to provide a wrapper, said means comprising movable cutting mechanism coacting with the carrier for operation to sever the webbing once during each reciprocation of the carrier following feeding of said web onto the table as aforesaid, and means coacting with said movable cutting mechanism and carrier for holding the severed end of the webbing, constituting a wrapper, on said table while the carrier moves away from said particular position following cutting of the webbing, and means cooperating with said carrier for enfolding an article in a wrapper held as aforesaid.

14. In a wrapping machine, in combination, an article carrier and cooperating means for feeding a wrapper webbing relative to said carrier, a relatively stationary wrapper supporting table mounted opposite a particular position of the carrier and disposed to receive and support a free end of the webbing advanced by said feeding means, and cutting mechanism mounted opposite one terminal position of the article carrier adjacent the aforesaid particular position so as to move in the general direction of reciprocation of the carrier into and out of cutting relationship with said webbing, said cutting mechanism being moved by the carrier out of cutting relationship when the carrier is disposed at said particular position, means for effecting movement of said cutting mechanism into cutting relationship with the webbing when the carrier moves out of said particular position whereby to cut a wrapper from the webbing, and means for holding said wrapper on said table and including a gripping member carried by said cutting mechanism and movable independently thereof into and out of gripping engagement against said table and a wrapper thereon, and means yieldingly and normally urging said gripping member into gripping engagement as aforesaid, said carrier being arranged to move the gripping member out of gripping engagement with said wrapper when the cutting mechanism is moved out of cutting relationship with the webbing.

15. In a wrapping machine, a reciprocable article wrapping elevator, means for feeding wrapper webbing crosswise of the movement of said elevator near one of the terminal positions of the latter, a rockable cutter opposite said terminal position and actuated by the elevator to shear said webbing as the elevator moves from said terminal position, stationary web holding means opposite said terminal position and onto which the free end of the webbing is fed by action of said feeding means, and movable web holding means carried by said rockable cutter and actuated by said elevator to engage and press the advanced portion of a wrapper against means on the elevator as the latter moves into said terminal position, said movable holding means being normally operable to press said advanced end of the webbing against said stationary holding means when the elevator is out of said terminal position, said elevator cooperating with said movable holding means to move the latter out of pressing engagement with respect to the stationary holding means when the elevator moves toward said terminal position.

16. In a wrapping machine, in combination, a reciprocable article carrier, a paper holding table adjacent the path of movement of the carrier, a paper cutting device mounted opposite a terminal position of the carrier adjacent said table, and paper gripping means including a rocking gripper mounted on said cutting device for movement into and out of holding engagement with said table and holding means on said carrier, said gripper being normally urged into holding engagement with said table to hold a wrapper paper thereon, and means operatively connected with said gripper and engaged by said carrier when the latter moves in one direction toward the table to rock said gripper out of holding engagement relative to the table and into yieldable holding engagement with said holding means on the carrier to release said wrapping paper from the table and hold the same yieldingly on the carrier.

17. The combination, with a reciprocable article carrier adapted to carry an article for wrapping purposes and cooperating means for feeding sheeting across the path of said carrier for partial wrapping of said article by movement of the carrier, of sheet cutting means comprising relatively movable and stationary cutting mechanism arranged with the movable part thereof operatively engaged by said carrier for actuation by the latter following partial wrapping of an article as aforesaid to cut said sheeting once during each wrapping operation of the carrier.

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