Jan. 13, 1959 E. A. ERNST 2,868,245

SACKING DEVICE

Filed March 26, 1956

FIG. 1.

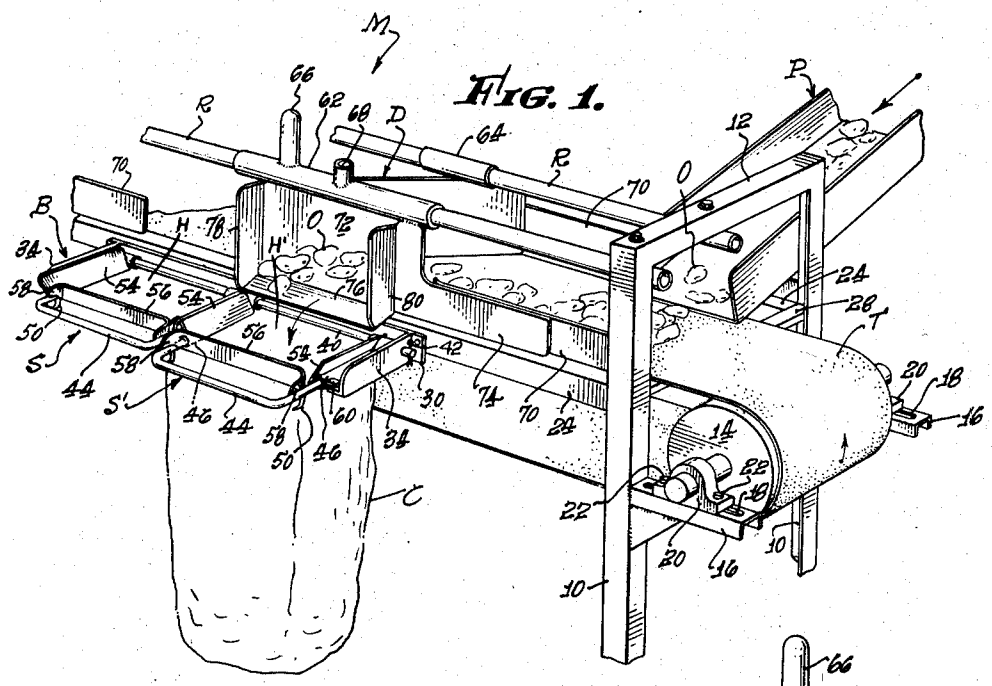


FIG. 2.

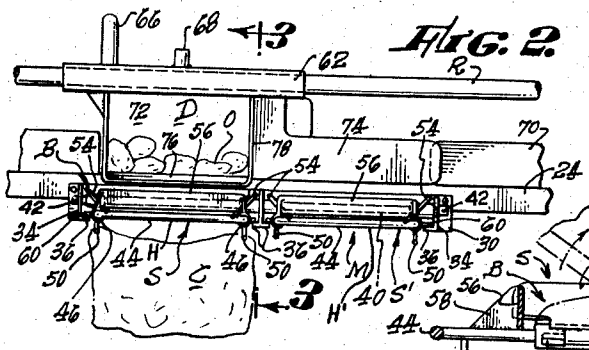


FIG. 3.

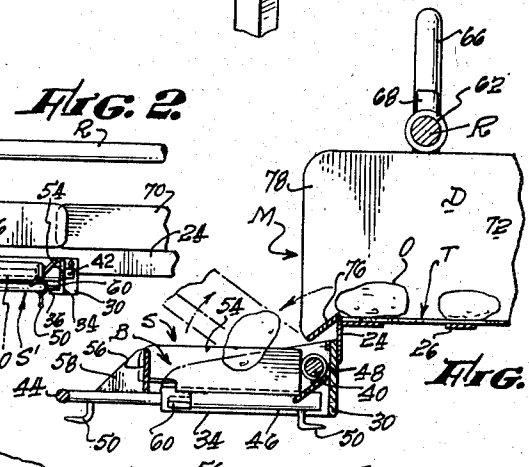


FIG. 3a.

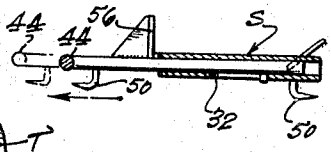
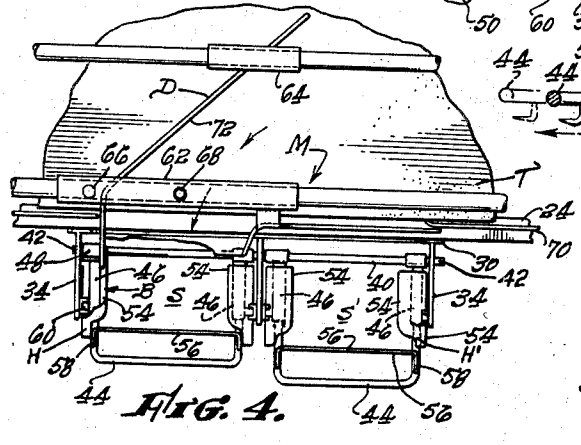


FIG. 4.



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SACKING DEVICE

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7 Claims. (Cl. 141—248)

The present invention relates to the field of automatic produce sacking devices of the type in which an endless conveyor belt carries graded fruits or vegetables to a plurality of adjacent sacking stations located alongside an edge of the belt and more specifically to a sacking device that is provided with means to transfer produce from said belt sequentially into containers held in said stations without cutting, bruising or otherwise injuring the graded produce when said transfer means are switched from one station to an adjacent station.

The primary purpose in devising the present invention is to eliminate certain disadvantages of the previously available sacking devices. One of the major disadvantages of previously available machines is the bruising, cutting or other injury to the already graded produce being sacked which results when the flow of produce from the moving belt is changed from one sacking station to another. In the unloading of the moving belt it is usual to provide a deflection plate or shearer extending obliquely across the belt to divert the stream of produce to the front edge of the belt to fall into a container held in a sacking station. When the container is full the deflection plate is moved longitudinally of the belt to a second, adjacent sacking station holding an empty container. In such movement some of the produce almost invariable becomes wedged between the deflection plate and the structure of the stations with the result that such produce is bruised or cut. The injured produce then falls into a container so that such container does not hold goods of uniform quality. Although most of the sacked produce conforms to the standards prescribed for a particular grade, some of the items at the bottom and top of the container may be injured as aforesaid. Consequently, upon a subsequent inspection of the goods, as for instance of a sack purporting to hold U. S. No. 1 potatoes, when the sack is first opened, cut and bruised potatoes will appear at the top. Since it is impossible from a surface inspection to determine whether or not the percentage of sub-standard potatoes is high enough to warrant down-grading of the entire sack, the entire sack must be regraded with considerable loss of time and at great expense. As such inspections may be conducted by governmental officials on a carload basis, if the particular sacks selected at random as exemplary of the quality of the carload reveal such injured produce, the entire carload may have to be regraded.

A major object of the present invention is to provide a sacking machine in which produce that is being carried by a moving belt is not cut, bruised or otherwise injured when the deflection means thereof is moved from one sacking station to another so that the grade of said produce as sacked is substantially the same as the grade of said produce when entering the machine.

Another object of the invention is to supply a sacking device in which one of a plurality of sacking stations is receiving a stream of graded produce while an adjacent station is having an empty container affixed thereto

preparatory to diverting said stream from said first mentioned station to said adjacent station.

A still further object of the invention is to furnish means on each station of a sacking machine whereby sacks may quickly and easily be connected to or removed from such stations.

These and other objects and advantages of the invention will become apparent from the following description of a preferred form thereof and from the drawing illustrating the form in which:

Figure 1 is a partial perspective view of a sacking machine embodying my invention;

Figure 2 is a partial front elevation view of the device;

Figure 3 is an enlarged vertical cross sectional view of the device taken on the line 3—3 of Figure 2;

Figure 3*a* is a fragmentary view similar to Figure 3 and showing the sack-connecting portion of the device;

Figure 4 is a fragmentary top plan view of the invention.

Referring now to the drawing for the general arrangement of the invention and in particular to Figure 1 thereof, it will be seen that a supply chute P extends from a source of graded produce (not shown) such as potatoes, downwardly onto an endless moving belt T that runs longitudinally of sacking machine M and forms a part thereof. A pair of sack holders H and H′ are located at stations S and S′ respectively, and also form a part of machine M. Sack holders H and H′ are disposed in side-by-side relationship alongside the front edge of belt T. As shown in Figures 1 and 2, each of the holders H and H′ is adapted to removably support an open container or sack C in such a position that material can be discharged therein from belt T. Machine M includes two laterally spaced longitudinally extending rails R that slidably support a deflection chute D above belt T, and this chute is reciprocally slidable between the holders H and H′.

Normally belt T is in continuous operation and moves potatoes O toward holders H and H′. The constant stream of potatoes O borne by belt T is directed forwardly relative to the belt by a vertical wall positioned downstream of the moving potatoes that is affixed to, and forms a part of deflection chute D. By manual adjustment of deflection chute D, the downstream wall can be so disposed as to cause potatoes O to be directed from belt T into a sack C held in holder H while a filled sack is removed from holder H′ and an empty sack C substituted in its stead. When the sack C in holder H has been filled with potatoes O, the deflection chute D is manually moved to cause potatoes on belt T to discharge into a container C held in holder H′. Thus, by manual adjustment of deflection chute D, the continuously moving stream of potatoes O can be alternately diverted into containers C held in holders H and H′, without interrupting the operation of belt T.

The structure of machine M is best shown in Figure 1, and although but one end of said machine is pictured in this figure, it will be understood that machine M has identical supporting means at both ends. Although a variety of materials could be used in its construction, it is preferably formed of angle iron members which are readily bolted, riveted or welded together to provide a rigid, durable framework. At both ends the machine is supported on the floor or ground by upright members 10 that at their upper ends have cross member 12 fastened thereto and extending therebetween. On each upright 10 is an outwardly extending bracket 16 that is formed of an inverted channel-shaped member having a longitudinally extending slot 18 in the web thereof. A bearing block 20 is fastened by means of bolts 22 to each bracket 16, bolts 22 extending through slot 18 so that roller 14 which is rotatably supported by said blocks is movable

longitudinally of machine M to adjust the tension of endless belt T supported by roller 14. Roller 14 is driven by means (not shown) to move belt T in the direction shown by the arrows.

Along each side of machine M is an elongate side member 24 fastened at its ends to uprights 10. As can be seen in Figure 3, side member 24 is an inverted L-shaped in cross section angle iron so disposed that the horizontally extending flange thereof supports the upper flight of belt T on the edges thereof. Further support to belt T is given by a plurality of parallel transversely spaced stringers 26 extending longitudinally of machine M in the same horizontal plane as side members 24 and supported on their ends by a cross member 28 extending between uprights 10 of each end of the machine.

Side member 24 that is adjacent the front edge of belt T has bolted to the vertically extending flange thereof an elongate metal strap 30 on which holders H and H' are supported. At each end of strap 30 and at the midpoint thereof a bar 34 is welded thereon that extends horizontally outward from machine M. Strap 30 and bars 34 define a rigid substantially E-shaped supporting framework for sack holders H and H' such as can be seen in Figure 4. Referring to Figures 3 and 4, it will be seen that each holder H and H' is pivotally supported between a pair of said bars 34. Bars 34 have axially aligned bores formed in the inwardly disposed end portions thereof through which an elongate rod 40 passes. Two pins 42 inserted through openings in the end portions of rod 40 prevent axial movement of the rod relative to bars 34. Each sack holder has a U-shaped member 44 on the arms of which two tubular members 46 are slidably mounted. Baffle means B for each holder H or H' consist of a pair of side baffle plates 54 on said tubular member 46 and an end baffle plate 56 on U-shaped member 44. End baffle plate 56 is a substantially rectangular sheet of rigid material with end flanges 58 formed thereon which are welded to the arms of U-shaped member 44 so that end baffle plate 56 is substantially vertically positioned across said arms. Referring to Figures 2 and 4, it will be seen that side baffle plates 54 are also substantially rectangular sheets of rigid material that along their lower edges are welded to tubular members 46 in such a way as to define a broad surface that slopes downwardly and inwardly of U-shaped member 44. On the inwardly disposed end of each side baffle plate 54 a transversely positioned sleeve 48 is welded thereto which sleeves are rotatably mounted on rod 40.

Side baffle plates 54 that are between adjacent holders H and H' have their upper edges in substantially abutting relationship so that any produce falling thereon cannot come to rest on or between said plates but must fall into one or the other of the adjacent sacking holders. This is of particular importance at the portions of said plates nearest chute D to prevent injury to the produce, as will later be pointed out in detail.

To support each sack holder in a horizontally extending position, bars 34 that are at the ends of strap 30 have horizontal tabs 36 affixed thereto pointing toward centrally disposed bar 34. Bar 34 has two tabs 36 mounted on opposite sides thereof. As can best be seen in Figure 1, each tubular member 46 is provided with an ear 60 on the outer end thereof that is adapted to come to rest on one of said tabs when a sack holder is pivoted downwardly to horizontal position.

The means for quickly and easily attaching and removing containers such as gunny sacks to and from each sack holder H or H' is clearly shown in Figures 3 and 3*a*. Each tubular member 46 on the inner end and normally lower side thereof has an L-shaped hook 50 fastened thereto. The points of the hooks 50 extend toward machine M so that when a holder is pivoted upwardly, hooks 50 point down. Similar hooks 50 are connected to the under sides of the arms of each U-shaped member 44. It will thus be seen that an empty gunny sack may be quickly and securely fastened to a holder by hooking an edge portion of the mouth of the sack onto back hooks 50 and then manually urging U-member 44 inwardly until opposite edge portions of the sack can conveniently be engaged by outer hooks 50. U-member 44 is then pulled outwardly to force the outer hooks 50 into the material of the sack C to maintain it in open position. When the sack C is full it can be removed from one of the holders H or H' merely by forcing the U-member 44 associated with that particular holder inwardly to withdraw outer hooks 50 from the material of the sack and the holder then pivoted upwardly to withdraw inner hooks 50 from the sack, which is then removed. The holder H or H' from which the sack is removed can then be lowered to a horizontal position where ears 60 come to rest on tabs 36 to support the holder in readiness to have another sack C fastened thereto.

Deflection chute D is of particular importance to the invention since it must cooperate with baffle means B in such a way that when said chute is moved from one station to another, there is no danger that any produce such as potatoes O can be caught therebetween to be cut or bruised. Chute D includes two transversely spaced sleeves 62 and 64 which are slidably mounted on the pair of rails R. Rails R are fastened at their ends to top cross members 12 of machine M and extend longitudinally over belt T so that chute D may be manually moved over said belt to a position opposite any sacking station by means of a handle 66 on front sleeve 62 which may also be provided with an oil cup 68 if desired. Side members 24 of machine M are provided with passage walls 70 on both sides of belt T, but at the portions of front side member 24 to which holders H and H' are fastened said walls 70 terminate so that chute D can slide from one station to another.

Chute D is preferably made from a rigid sheet material and is defined by a downstream wall 72, a side wall 74 and a web 76 intermediate said walls. Downstream wall 72 extends obliquely across belt T and the lower edge thereof is sufficiently close to said belt that produce cannot wedge therebetween. An overhanging portion 78 of downstream wall 72 extends transversely beyond the front of machine M and at its lower projecting edge is joined to an end of web 76. Web 76 has an edge adjacent the front edge of belt T from which said web slopes downwardly and outwardly. At the other end of web 76 outwardly flanged portion 80 of sidewall 74 is joined thereto from which side wall 74 continues upstream along the front edge of belt T. In Figure 1 it will be seen that side wall 74 is slidable alongside of the passage wall 70 that extends between the upstream end of machine M and holder H so that when chute D is positioned opposite holder H, side wall 74 and the passage wall 70 are in overlapping relationship. Referring to Figures 2 and 4, it will be seen that when chute D is positioned opposite holder H', side wall 74 thereof has moved opposite holder H and prevents any potatoes O from being deflected into the sack C held by holder H and also permits pivotal movement of holder H so that sacker can be removed from and fastened thereto in the manner previously described.

The relationship of chute D to baffle means B that prevents bruising or cutting of potatoes O can best be seen in Figures 2, 3 and 4. As has been pointed out, in ordinary sacking devices such injury occurs during the shifting of the conventional shearer or deflection plates from one sack holder to another when produce becomes caught by the structure of the sacking station to be cut by the shearer moving relative thereto, in the fashion of a knife. However, with the present invention as chute D is being moved in either direction across side baffle plates 54 that are intermediate holders H and H', there is no danger that any potato O can be cut by movement of

chute D across the side baffle plates. In order for a potato O to be cut by movement of deflection chute D it must be caught between two opposing edges or it must be held relatively stationary while one edge is moved relative thereto. It will be noted in Figure 3 that web **76** of chute D prevents a potato O from falling into any position under overhanging portion **78** of downstream wall **72** or under flange **80** of side wall **74**. Therefore, the only portions of chute D that could cut or bruise a potato are the vertically extending edges of portions **78** and **80**, but these edges are not opposed by any of the structure of baffle means because the upper horizontally extending edges of side baffles **54** are lower than any portion of chute D.

For example, let it be assumed that chute D is moving to the left as viewed in Figure 1, from holder H' to holder H. During such movement a stream of produce is continually being carried downstream on belt T to come into contact with downstream wall **72** and then urged transversely across the front edge of belt T and over web **76** to fall downwardly. Obviously, with chute D moving between stations some of the produce, such as potatoes O, will fall onto side baffle plates **54** to be deflected into one or the other of the holders H or H', but because the baffle plates between stations are oppositely inclined with their top edges in substantially abutting relationship (Figure 2) a potato O cannot come to rest on baffle means B and must fall downwardly either to the left or right. If a potato O is simultaneously in contact with web **76** of chute D adjacent flange **80** and with side baffle plate **54** on the left side of holder H' when chute D is moving to the left as aforesaid, that potato can be lifted over said baffle plate if carried by web **76** or fall from web **76** onto said baffle plate, but as no edge of chute D works in opposition to any edge of baffle means B, the potato cannot be cut.

The operation of the invention is extremely simple. Deflection chute D is positioned opposite either holder H or H' and containers C attached to both stations in the manner previously described. Belt T is then set in motion to carry downstream potatoes O that are received from supply chute D. Chute D deflects said potatoes into the container being filled and as the container approaches fullness chute D is manually moved toward the adjacent sack holder. During such movement potatoes O will be deflected into either sack holder and when the sack held by one holder is full, chute D is moved to direct potatoes into the sack held by the other holder. While one of the sacks in one holder is being filled, the filled sack in the other holder is removed, with hooks **50** being released by pressing U-frame **44** inwardly and then pivoting said frame upwardly in the manner previously described. An empty sack C is then attached to the holder from which the filled sack has been removed. In this way chute D is reciprocally moved between holders, filling one while the container is replaced in the other, and the stream of potatoes O is continuously packaged without being injured by such reciprocal movement of the chute.

Although the form of invention herein shown and described is fully capable of achieving the objects and providing the advantages hereinbefore mentioned, it is to be understood that it is merely illustrative of the presently preferred embodiment of the invention and that I do not mean to limit myself to the details of construction herein shown and described other than as defined in the appended claims.

I claim:

1. A sacking machine comprising a moving belt for delivering graded produce to a plurality of adjacent sacking stations located alongside the front edge of said belt for depositing said produce in sacks, a device to transfer said produce from said belt sequentially into said sacks, said device including, sack holders at said station; a deflection chute that is movably supported over said belt so as to be reciprocally movable longitudinally of said belt with a portion of said chute overhanging the front edge of said belt and said holders, and having a downstream wall extending obliquely across said belt so that produce carried by said belt coming into contact with said downstream wall is urged transversely across said belt through said overhanging portion to drop into the open mouth of a sack held in one of said sack holders, and baffle means extending outwardly and depending inwardly on each of said sack holders that is adapted to deflect produce dropping from said overhanging portion of said chute into said sack, with the portions of said baffle means that are disposed intermediate adjacent holders being in substantially abutting relationship so that when said chute is moved from one holder to an adjacent holder, said produce is prevented from coming to rest between holders and is deflected into one of said adjacent sack holders.

2. A device as defined in claim 1 in which said deflection chute downstream wall has a lower edge which is sufficiently close to said belt to prevent any entry therebetween of any substantial portion of any single item of said produce and characterized further by the fact that said chute is provided with a side wall extending upstream from said overhanging portion along the front edge of said belt so that produce deflected transversely of said belt by said downstream wall is prevented from dropping off said belt at any position upstream from said overhanging portion of said chute.

3. A device as defined in claim 2 in which said overhanging portion of said chute is substantially U-shaped in configuration and has an inclined web area with an edge adjacent said front edge of said belt from which said web extends downwardly away from said belt so that said produce is deflected from said belt across said web to fall into a container held in one of said holders.

4. A sacking machine comprising a moving belt for delivering graded produce to a plurality of adjacent sacking stations located alongside the front edge of said belt for depositing said produce in sacks, a device to transfer said produce from said belt sequentially into said sacks, said device including: sack holders at said stations; a pair of parallel rails on said machine positioned above said belt and extending longitudinally thereof, a deflection chute that is slidably suspended from said rails, said chute being defined by a downstream wall thereof, a side wall thereof and a web intermediate said walls, said downstream wall being a vertically disposed rigid member extending obliquely across said belt with its lower edge sufficiently close to said belt to prevent entry therebetween of any substantial portion of any single item of said produce and said downstream wall having an overhanging portion that extends transversely beyond said front edge of said belt, and said side wall of said chute being an elongate vertically disposed rigid member extending alongside said front edge of said belt and having an outwardly turned overhanging flange portion extending transversely beyond said belt so that said overhanging portions of said downstream wall and side wall are joined at their lower edges by said web extending therebetween with an edge adjacent said front edge of said belt, said web extending downwardly away from said front edge so that produce carried by said belt upon striking said downstream wall of said chute is deflected transversely across said belt and said web to drop into a sack held in one of said holders, with said side wall of said chute preventing any produce from dropping off said belt at any position upstream from said web of said chute, and baffle means on each of said sack holders that are adapted to deflect produce dropping from said overhanging portion of said chute into said sack, with the portions of said baffle means that are disposed intermediate adjacent said holders being in substantially

abutting relationship so that when said chute is moved from one of said holders to an adjacent holder, said produce is prevented from dropping between said holders and is deflected into one of said adjacent holders.

5. A sacking machine comprising a moving belt for delivering graded produce to a plurality of adjacent sacking stations located alongside the front edge of said belt for depositing said produce in sacks held in said stations, a device to transfer said produce from said belt sequentially into said sacks, said device having: sack holders at said stations alongside the front edge of and and lower than said belt, each of said holders including a U-shaped member that is provided with means to suspend an open sack therefrom, baffle plate means on each of said U-shaped members that are adapted to deflect produce dropping from said belt into said sack, with the portions of said baffle plate means that are disposed intermediate adjacent of said holders being in substantially abutting relationship to prevent entry therebetween of any substantial portion of any single item of said produce; a pair of parallel rails on said machine positioned above said belt and extending longitudinally thereof, a deflection chute that is slidably suspended from said rails, said chute being defined by a downstream wall thereof, a side wall thereof and a web intermediate said walls, said downstream wall being a vertically disposed rigid member extending obliquely across said belt with its lower edge sufficiently close to said belt to prevent entry therebetween of any substantial portion of any single item of said produce and said downstream wall having an overhanging portion that extends transversely beyond said front edge of said belt, and said side wall of said chute being an elongate vertically disposed rigid member extending alongside said front edge of said belt and having an outwardly turned overhanging flange portion extending transversely beyond said belt so that said overhanging portions of said downstream wall and side wall are joined at their lower edges by said web extending therebetween with an

edge adjacent said front edge of said belt, said web extending downwardly away from said front edge so that produce carried by said belt upon striking said downstream wall of said chute is deflected transversely across said belt and said web to drop into a sack held in one of said holders, with said side wall of said chute preventing any produce from dropping off said belt at any position upstream from said web of said chute.

6. A device as defined in claim 5 in which each of said U-shaped members is pivotally connected to said machine and each of said holders is provided with means to support said member in horizontally extending container-supporting position so that when said deflection chute is moved from a first one of said holders that supports a container full of said produce to an adjacent one of said holders, said U-shaped member of said first holder after removal therefrom of said full container may be pivoted upwardly so that an empty container can be attached to said container suspending means of said member.

7. A device as defined in claim 6 in which: each arm of said U-shaped member is telescopically slidable in a tubular member, the inner ends of each of said members being pivotally supported on said machine alongside the front edge of said belt; and in which said means to support an open container in each of said holders comprises an inner hook on the normally lower side of the inner end of each of said tubular members, said inner hooks terminating in a point that extends toward said machine and an outer hook on the lower side of each arm of said U-shaped member, said outer hooks terminating in a point that extends outwardly from said machine.

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