W. A. JOPLIN.

BAG OR LINER SPREADING DEVICE.

APPLICATION FILED FEB. 2, 1911.

1,007,358.

Patented Oct. 31, 1911.

2 SHEETS-SHEET 1.

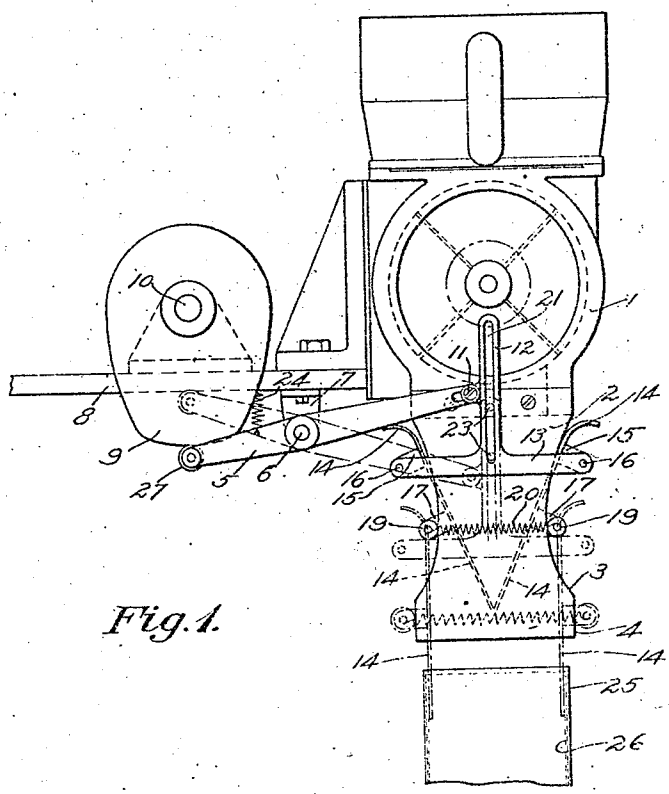

Fig. 1.

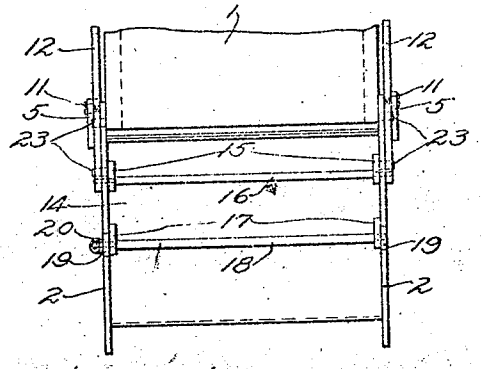

Fig. 2.

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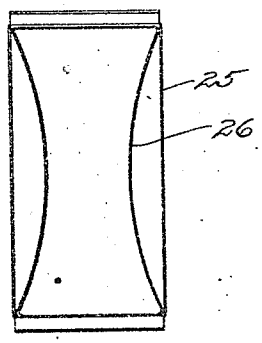

Fig. 3.

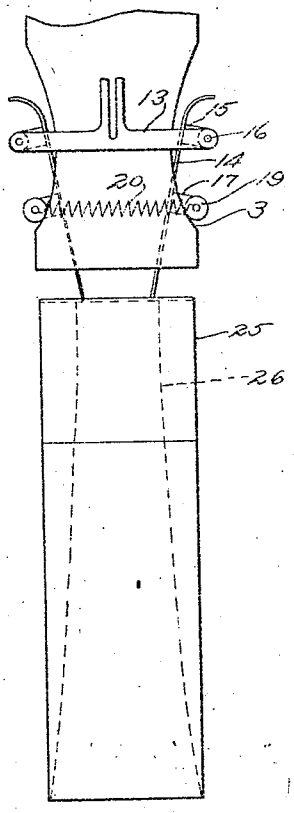

Fig. 4.

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UNITED STATES PATENT OFFICE.

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BAG OR LINER SPREADING DEVICE.

1,007,358. Specification of Letters Patent. Patented Oct. 31, 1911.

Application filed February 2, 1911. Serial No. 606,190.

To all whom it may concern:

Be it known that I, WILLIAM A. JOPLIN, a citizen of the United States, residing at Lawrence, in the county of Essex and State of Massachusetts, have invented a certain new and useful Improvement in Bag or Liner Spreading Devices, of which the following is a specification, reference being had therein to the accompanying drawings.

In putting up package goods by machines paper cartons are very extensively used for the package, and for certain classes of goods it is important to have a lining for the carton. The cartons usually come in knocked down form and are usually set up one at a time as they are to be filled. In many cases it is the practice to insert the lining by hand after the carton is set up just before filling. When the lining is first put into the carton, if done by hand, its sides will bulge in, and it is important to have the lining squared out to closely fit the interior of the carton before the goods are delivered into it from the hopper. Sometimes paper bags are employed instead of cartons and when such are used they should be opened out when positioned to receive the goods from the hopper or other feed device.

The object of the present invention is to provide an attachment to the filling machine whereby the paper receptacle whether a paper lining or a paper bag, as the case may be, will be opened or spread out into proper shape before the material is delivered to it and whereby the opening of the spreader controls the delivering of material into the carton as well as spreads the lining.

The invention will be fully understood from the following description taken in connection with the accompanying drawings and the novel features will be pointed out and clearly defined in the claims at the close of the specification.

In the drawings,—Figure 1 is a side elevation of a hopper of a filling machine having attached thereto bag opening mechanism embodying the invention, and a lined carton in position to be operated upon, the filling mechanism being omitted as that does not form a part of the present invention. Fig. 2 is a front elevation of the lower portion of the hopper and of the bag opening mechanism shown in Fig. 1. Fig. 3 is a plan view of a carton with the lining inserted before it is squared out by the spreader. Fig. 4 is a side view showing the spreading wings about to enter into the carton and partly opened out.

Referring now to the drawings,—1 is the hopper through which the material is delivered to the package. Attached to two opposite sides of the lower part of the hopper are two downwardly extending side plates 2. The outer edges of each of these side plates 2 have outwardly flaring portions 3 toward the lower ends which form cam surfaces for the purpose to be hereinafter described. Preferably the lower portion 4 below the cam surfaces 3 is straight. A lever 5 is fulcrumed intermediate its ends at 6 to a hanger 7 which depends from a stationary support 8. One arm of said lever 5 is provided with a roller 27 which engages with a cam 9 mounted on a shaft 10 and the other arm of said lever is pivotally connected at 11 with an upright portion 12 of a cross-head 13. A spring 24 holds the roller 27 in constant engagement with the cam. Preferably there are two of these cross-heads and levers, one on the outer side of each of the two side plates 2. Between the two side plates 2, 2, are the two downwardly extending wing plates 14, 14, which are pivoted to the cross-heads 13, 13, and are wide enough to close the entire width of the space between the two side plates 2, 2, so that the two side plates and the two wing plates together form a four-sided chute or mouth piece for the hopper. The wing plates are so controlled that normally they converge downwardly until their lower ends are in contact with each other thereby closing the lower end of the passage between the side plates 2, 2.

As shown in the drawings the means for pivoting the two wings 14, 14 is to form each of them with a pair of ears 15, one at each edge near the upper end. A shaft 16 extends across the full width of each wing and extends through both ears 15 of the wing so that the wing is pivoted thereon. Each of said plates also has another pair

of ears 17 projecting outwardly therefrom at some point below the first pair of said ears 15. Connecting each pair of ears 17 on each wing is a shaft 18 carrying a roller 19 which engages the outer edge of the side plate 2. A spring 20 connects the two shafts 18, 18, together and the tension of the spring is sufficient to retain the two rollers 19, 19, in contact with the outer edges of the plates 2, 2. Preferably the upper ends of the wing plates 14, 14 are curved upwardly and outwardly.

The upwardly extending arm 12 of each cross-head 13 is formed with a vertical slot 21. Two pins 22, 23, one above the other, project from each of the sides plates 2 outwardly through the slot 21 forming guides for the cross-head.

The shape of the cam 9 is such that after the high part of the cam which is shown in Fig. 1 as in contact with the roller 27, turns so that the lower part of the cam comes in contact with the roller, the lever 5 will be turned on its fulcrum by the spring 24 and the cross-heads 13 will be moved downward. As the cross-heads move downward the rollers 19 engage with the cam edges 3 of the side plates 2 thereby spreading or opening out the lower ends of the wings 14 as the wings 14 are carried down by the cross-heads. The carton 25 containing the lining 26 which will previously have been positioned just below the side plates 2 will be in position for the lower ends of the wings 14 to enter the lining while the wings are still in their converging positions and as the wings are carried down and spread apart they will spread open the lining of the carton until the wings are spread out into parallel position, as shown by the dotted lines in Fig. 1, which is the limit of their outward spread. During the latter part of the downward movement of the cross-heads the rollers 19 will engage the lower straight edges of the side plates 2 and the wing plates will then move down parallel with each other. Preferably the plates should be so proportioned with reference to the bags or cartons which are used that when the wings 14 are in their spread out parallel position they will be opened just sufficient to spread open the lining to the full width of the carton.

A paper bag which may be used as the package or container without any carton may be opened in the same way as described for opening the lining, if properly supported in an upright position beneath the spreaders.

The cam shaft 10 may be rotated by any suitable mechanism and it is not deemed necessary to show any particular driving means therefor.

What I claim is:—

1. A hopper funnel comprising two parallel downwardly extending plates which form two opposite sides of the funnel, the opposite edges of said plates having downwardly diverging portions, two movable plates forming two opposite sides of the funnel between said parallel sides, a vertically movable head to which said movable plates are pivoted, means for vertically reciprocating said head and said movable plates, means for normally holding said movable plates converging toward each other downward when said head is in its uppermost position the downward movement of the head causing the descent of said movable plates and means connected with the movable plates which engage said diverging edges of the side plates thereby spreading apart the converging ends of the movable plates.

2. A hopper funnel having two parallel downwardly extending sides, two sides forming two opposite sides of the funnel between said parallel sides bridging the space between them and movable vertically with relation thereto, a vertically movable head to which said movable sides are pivoted, means for normally holding said movable sides converging toward each other downward to close the outlet passage between said fixed sides, means for vertically reciprocating said head and the movable sides pivoted thereto with relation to the said fixed parallel sides and means for causing the lower ends of said movable sides to spread apart from each other.

3. A funnel having one pair of opposite sides which are fixed apart with relation to each other and another pair of opposite sides which are movable vertically with relation to said fixed sides and normally converge together at the lower ends between the first pair of sides and close the outlet end of the funnel and means for moving said converging sides bodily downward with relation to the fixed sides and separate means for spreading the converging ends apart below the lower ends of the fixed pair of sides.

4. A funnel having one pair of downwardly extending parallel sides fixed with relation to each other and a pair of downwardly extending movable sides between said pair of fixed sides which normally converge downwardly and close the outlet end of the funnel, said movable sides being movable bodily downward with relation to the fixed sides, means for moving said converging sides downward with relation to the fixed sides and means for spreading the converging ends apart.

5. A hopper funnel having two downwardly extending fixed sides parallel with

and opposite each other, two downwardly extending movable sides between said two fixed sides and of a uniform width to bridge the space between said fixed parallel sides, said movable sides being fulcrumed to a support movable vertically with relation to said parallel sides and the lower ends normally converging to a meeting line to close the passage between said parallel sides, means for moving said fulcrum and movable sides downward and means for turning said movable sides on their fulcrum to spread apart the converged lower ends.

6. A hopper funnel having two downwardly extending fixed sides opposite each other, two downwardly extending movable sides between said two fixed sides and of a width to close the space between said fixed sides, said movable sides being pivoted to a support which is vertically movable with relation to said fixed sides the lower ends of the movable sides normally converging to a meeting point to close the outlet from the lower end of the fixed sides, means for turning said movable sides on their fulcrum to spread apart the converged lower ends, and means for causing the said movable walls and fulcrum to descend while they are being spread apart.

7. A hopper funnel having two downwardly extending fixed side walls which form two opposite sides of the funnel, two downwardly extending movable side walls between said two fixed side walls of a width to close the space between said fixed walls, said movable walls being pivoted to a support which is vertically movable with relation to said fixed walls the lower ends of the movable walls normally converging to a meeting point to close the outlet, means for turning said movable walls on their fulcrum to spread apart the converged lower ends, means for causing the said movable walls and fulcrum to descend while they are being spread apart, the lower ends of said movable walls descending to some distance below the lower ends of the fixed walls and means for causing said movable walls to assume parallel relation to each other during the latter part of the descent.

8. A hopper funnel comprising two parallel downwardly extending plates which form two opposite sides of the funnel, the opposite edges of said plates having downwardly diverging portions, two movable plates forming two opposite sides of the funnel between said parallel sides, a vertically movable head to which said movable plates are pivoted, means for vertically reciprocating said head and said movable plates, arms projecting from said movable plates having rollers which engage with the outer edges of said parallel wall plates, means for normally holding said movable plates converging toward each other downward when said head is in its uppermost position and for holding said rollers in constant engagement with the outer edges of the parallel side plates, the downward movement of the head causing the descent of said movable plates and causing the said rollers to ride down on the diverging edges of the side plates thereby spreading apart the converging ends of the movable plates.

9. A hopper funnel comprising two parallel downwardly extending plates which form two opposite sides of the funnel, the opposite edges of said plates having downwardly diverging portions, two movable plates forming two opposite sides of the funnel between said parallel sides, a vertically movable head to which said movable plates are pivoted, means for vertically reciprocating said head and said movable plates, guides carried by said movable plates which engage with the outer edges of said parallel wall plates, means for normally holding said movable plates converging toward each other downward when said head is in its uppermost position and for holding said guides in constant engagement with the outer edges of the parallel side plates, the downward movement of the head causing the descent of said movable plates and causing the said guides to ride down on the diverging edges of the side plates thereby spreading apart the converging ends of the movable plates, said parallel side plates having straight parallel edges below said diverging portions with which said guides engage after the guides ride off of the said divergent portions and holding said movable side plates in parallel relation to each other.

10. A hopper funnel comprising two parallel downwardly extending plates which form two opposite sides of the funnel, the opposite edges of said plates having downwardly diverging portions, two movable plates forming two opposite sides of the funnel between said parallel sides, a vertically movable head to which said movable plates are pivoted, means for vertically reciprocating said head and said movable plates, guides carried by said movable plates which engage with the outer edges of said parallel wall plates, means for normally holding said movable plates converging toward each other downward when said head is in its uppermost position and for holding said guides in constant engagement with the outer edges of the parallel side plates, the downward movement of the head causing the descent of said movable plates and causing the said guides to ride down on the diverging edges of the side plates thereby

spreading apart the converging ends of the movable plates, said parallel side plates having straight parallel edges below said diverging portions with which said guides engage after the guides ride off of the said divergent portions and holding said movable side plates in parallel relation to each other, the lower ends of said movable plates descending down below the lower end of said fixed parallel plates.

11. A funnel having two opposite sides fixed apart with relation to each other, two other opposite sides which lie between said fixed sides at right angles thereto and which extend across between said fixed sides and normally converge toward each other downward and close the outlet from the lower end between said fixed sides, means for vertically reciprocating said movable sides with relation to said fixed sides, means for causing the said movable sides to dwell at the end of each stroke, means for spreading the converging ends apart from each other on the downstroke and means for bringing said movable sides into converging relation again on the up stroke.

12. In combination with a hopper, a funnel attached to the lower end thereof having two opposite side walls which extend downward parallel with each other, a vertically reciprocable frame having a cross-head alongside of each of said fixed side walls, movable walls pivoted to said cross-heads and extending across the space between said two fixed walls, means for normally holding said two movable walls with their lower ends in converging engagement with each other, the outer edges of said fixed walls having downwardly diverging portions terminating in downward parallel portions, guides attached to said movable walls and engaging with the outer edges of said fixed walls, means for vertically reciprocating said frame and cross-head with a dwell at each end of the stroke, said guides for the movable walls riding down on the diverging edges of the fixed walls and thence onto the parallel edges of the fixed walls on the downward stroke thereby spreading the converging ends of the movable walls until they assume a parallel relation with each other and project below the lower ends of the fixed walls and means for bringing said movable walls into converging relation again on the up stroke.

13. A funnel for a hopper having two parallel sides, two movable wings which extend crosswise between said parallel sides and converge downward to a meeting edge crosswise between said parallel sides, said wings being vertically movable with relation to said fixed sides, means for moving said wings down while the parallel sides are stationary and means for spreading said wings and thereby opening the discharge from the funnel.

14. In combination with a hopper, a discharge funnel connected therewith, said funnel having two stationary parallel sides, two movable wings which extend crosswise between said parallel sides and which normally converge together to a meeting edge above the lower ends of said parallel sides to close the outlet from the funnel, means for causing said entire movable wings to descend with relation to the stationary parallel sides until the lower ends extend below the lower end of said parallel sides and means for spreading said wings apart from each other, said wings also being adapted to enter and spread a bag or box lining positioned beneath the funnel.

15. A hopper funnel comprising two parallel downwardly extending plates which form two opposite sides of the funnel, the opposite edges of said plates having downwardly diverging portions, two movable plates forming two opposite sides of the funnel between said parallel sides, a vertically movable head to which said movable plates are pivoted, means for vertically reciprocating said head and said movable plates, guides carried by said movable plates which engage with the outer edges of said parallel wall plates, means for normally holding said movable plates converging toward each other downward when said head is in its uppermost position and for holding said guides in constant engagement with the outer edges of the parallel side plates, the downward movement of the head causing the descent of said movable plates and causing the said guides to ride down on the diverging edges of the side plates thereby spreading apart the converging ends of the movable plates.

16. In combination with a hopper, a funnel attached to the lower end thereof having two opposite side walls which extend downward parallel with each other, a vertically reciprocable frame having a cross-head alongside of each of said fixed side walls, movable walls pivoted to said cross-heads and extending across the space between said two fixed walls, means for normally holding said two movable walls with their lower ends in converging engagement with each other, guides attached to said movable walls, diverging fixed guides with which said movable guides engage, means for vertically reciprocating said frame and cross-head with a dwell at each end of the stroke, said guides for the movable walls riding down on the diverging fixed guides on the downward stroke thereby spreading the converging ends of the movable walls.

17. A funnel having one pair of downwardly extending sides fixed apart with relation to each other, a pair of downwardly extending movable plates between said pair of fixed sides which normally converge toward each other downwardly, said movable plates being movable bodily downward with relation to said fixed sides, means for moving said converging plates downward bodily with relation to said fixed sides and means for spreading the converging ends apart.

In testimony whereof I affix my signature, in presence of two witnesses.

WILLIAM A. JOPLIN.

Witnesses:
WILLIAM A. COPELAND,
ALICE H. MORRISON.