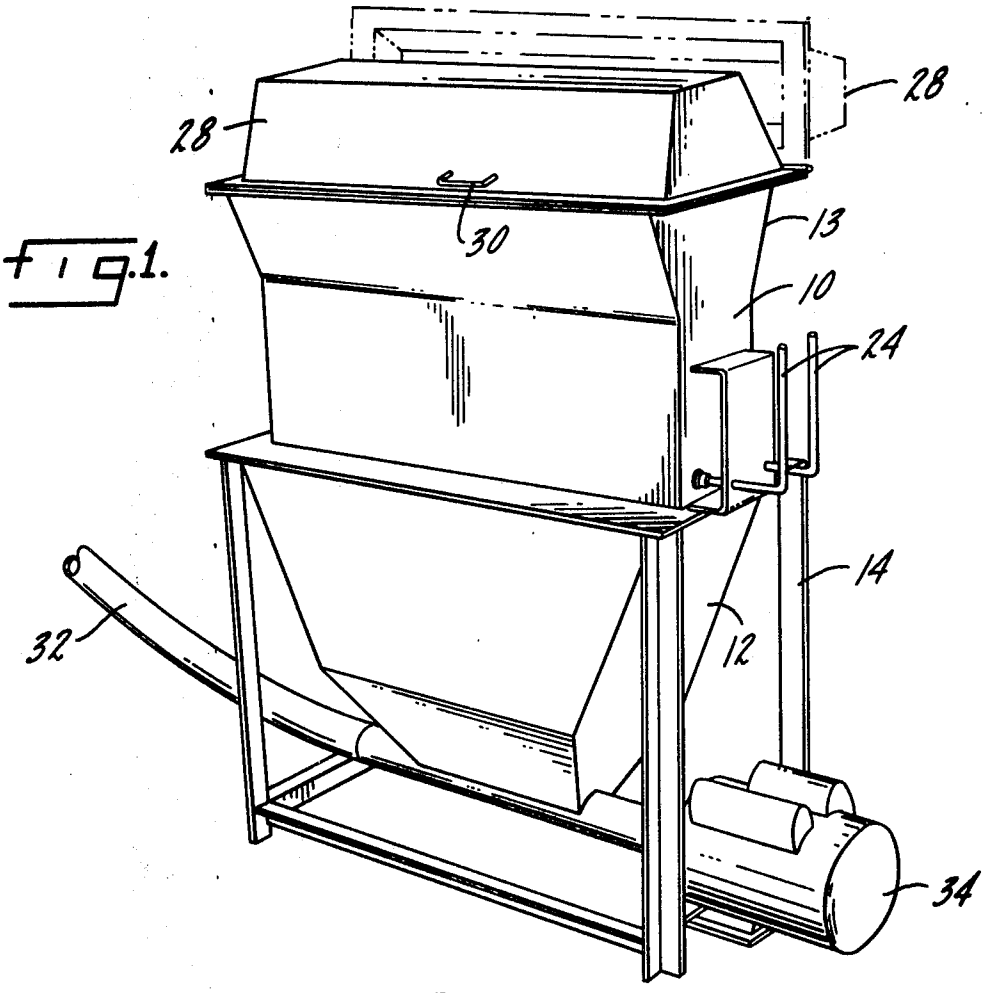
Sept. 20, 1971 R. JUNE II 3,606,057

BAG OPENER

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fig. 1.



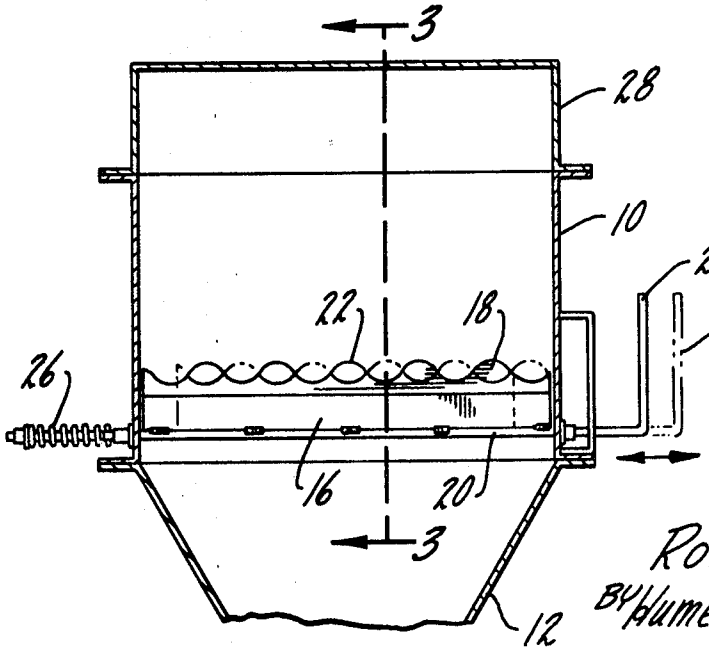


fig. 2.

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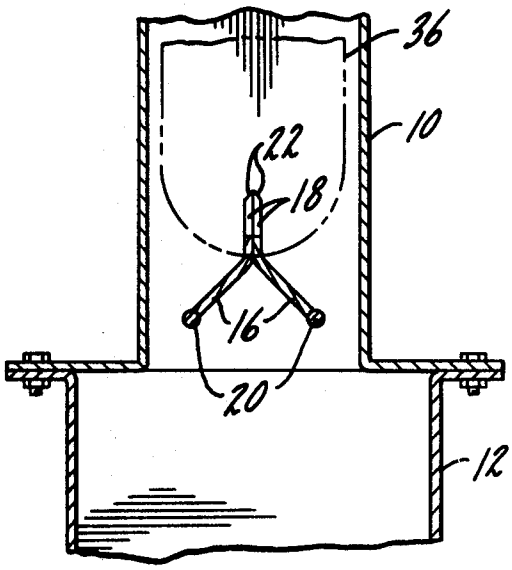


Fig. 3.

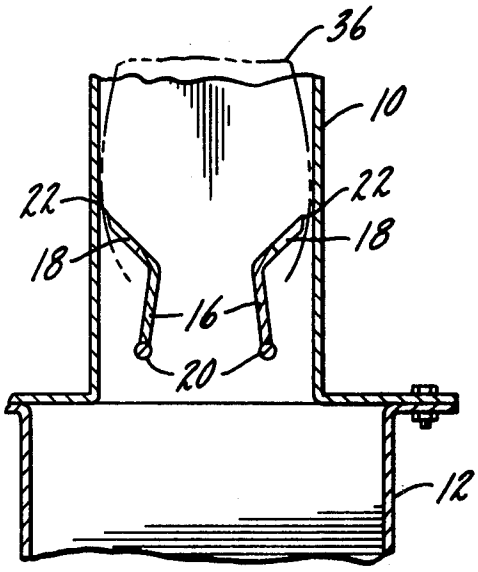


Fig. 4.

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BAG OPENER

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Int. Cl. B65b 69/00
U.S. Cl. 214—305 8 Claims

ABSTRACT OF THE DISCLOSURE

A bag receiving hopper having two hinged blades therein. The blades having undulating cutting edges and being arranged for side-by-side contact during cutting. One of said blades being longitudinally displaceable with respect to the other and said blades being pivoted away from each other during the bag emptying operation. A cover is provided for said hopper to retain dust within said hopper and said hopper communicates with a product receiving hopper located therebelow. Said product receiving hopper has conveyor means communicating therewith.

The present invention relates to an improved bag opener.

While devices for opening bags have long been known in the art, such devices have suffered from a number of disadvantages. Many of them have been difficult to operate while others have been dangerous to use, owing to the sharp, upstanding blades within easy reach of the user. An additional problem has been that bag openers in the prior art often do not effectively rip the bag, so that the contents are not completely removed. Finally, there is a need for a bag opener that can be covered when the bag is opened in order to prevent excessive amounts of dust and the like from being released into the atmosphere.

Generally, the present invention relates to an improved apparatus for opening bags which comprises a bag-receiving hopper and a product-receiving hopper positioned below the bag-receiving hopper and communicating with the bottom thereof. A pair of hinged blades having upwardly projecting cutting portions is positioned in the bag-receiving hopper. The cutting portions are normally in side-by-side contact with one another, and are positioned to penetrate into the interior of a bag placed into the bag-receiving hopper. The blades are hinged to permit the cutting portions to be separated and to allow material to flow from the bag to the product-receiving hopper when the cutting portions are so separated.

The invention, its construction and method of operation, together with the objects and advantages thereof, will be best understood by reference to the following detailed description, taken in conjunction with the drawings, in which:

FIG. 1 is a perspective view of an apparatus embodying the features of the present invention;

FIG. 2 is a cross-sectional side elevation view of the apparatus shown in FIG. 1;

FIG. 3 is a cross-sectional view taken along line 3—3 of FIG. 2; and

FIG. 4 is a view similar to FIG. 3, but showing the blades in a separated position.

Referring to FIG. 1, in the embodiment shown, the apparatus of the present invention has an upper, bag-receiving hopper **10** and a lower, product-receiving hopper **12** positioned below the bag-receiving hopper **10**. The bag-receiving hopper **10** preferably has a flared portion **13** at the top, in order to make it easier to guide a bag into it. In the lower portion of the bag-receiving hopper **10**, the opposite walls are preferably parallel to facilitate the proper positioning of the bag while it is opened.

While the separation between the bag-receiving hopper **10** and product-receiving hopper **12** is clear in the embodiment shown, it is possible for the product-receiving hopper **12** to simply form the lower portion of the bag-receiving hopper **10**, there being no definite dividing line between the two. As a general matter, as hereinafter discussed, the hinged blades will be ordinarily positioned at or near the bottom of the bag-receiving portion of the apparatus. In any event, in the preferred embodiment, the product-receiving hopper **12** is wider at its top than the bottom of the bag-receiving hopper **10** in order to produce a higher capacity in the product-receiving hopper **12** than would otherwise be possible.

Both the bag-receiving hopper **10** and the product-receiving hopper **12** are supported by a frame **14**, which permits the apparatus to stand on a flat surface.

Referring to FIGS. 2–4, a pair of hinged blades **16** is positioned in the bag-receiving hopper **10**, preferably at the bottom thereof. As shown in FIGS. 3 and 4, these blades have an angled cross-sectional shape and upwardly projecting cutting portions **18**. The sides of the blades **16** opposite the cutting portions **18** are separated from one another, and each is connected to a longitudinal bar **20**, which is rotatable to produce a hinging action, and to move the blades between the positions shown in FIGS. 3 and 4. Suitable stop means (not shown) are provided for keeping the blades **16** from rotating inwardly beyond the position shown in FIG. 3. As shown in FIG. 3, in the preferred embodiment, the cutting portions **18** of the blades **16** preferably have upper, cutting edges **22** having an undulating shape. However, the apparatus can also be constructed utilizing blades **16** having cutting edges **22** of different shapes, such as a toothed or notched shape.

Each of the longitudinal bars **20** is journaled at the ends of the bag-receiving hopper **10**. At one end, the longitudinal bars **20** are angled upwardly outside of the hopper **10** to form a pair of handles **24**. By moving the handles **24**, an operator can rotate the bars **20**, and move the blades between the positions shown in FIGS. 3 and 4.

In the preferred embodiment, one of the blades **16** is longitudinally displaceable relative to the other while the cutting portions **18** are in side-by-side contact (or very close spaced relationship) as shown in FIG. 3. This longitudinal displacement of one of the blades relative to the other produces an efficient cutting of the bag, and aids in assuring that all of the contents will be removed. If one of the blades is not longitudinally displaceable relative to the other, it is necessary to depend upon the weight of the bag itself to produce the cutting.

Referring to FIG. 2, in order to render one of the blades longitudinally displaceable with relation to the other, it is essential that the longitudinal bar **20** upon which it is mounted be longitudinally movable as well as rotatable. Therefore, the end of one of the longitudinal bars **20** opposite the handle **24** projects outside the bag-receiving hopper **10**, and has a spring **26** positioned thereon. In the embodiment shown, the spring **26** normally maintains the blade **16** displaced toward the left-hand end of the bag-receiving hopper **10**, so that the handle **24** must be pulled in order to produce longitudinal movement of the blade **16**. This longitudinal movement of the handle **24** and blade **16** is shown by the phantom lines in FIG. 2. Of course, the opposite arrangement could also be employed, wherein the spring **26** is constructed to maintain the blade **16** normally at the right-hand end of the bag-receiving hopper **10**, so that the handle **24** would be pushed in order to achieve displacement. Obviously, it is not even necessary to have a spring **26**. However, the spring **26** is a convenience in that it returns the cutting blade **16** to its original position, so that to rip the bag, the operator simply pulls the handle **24** in an out-

ward direction and lets go. It is clear that, in order to permit longitudinal movement, the blade **16** that is to be moved must have a length less than its associated interior dimension within the bag receiving hopper **10**, as shown in FIG. 2.

Referring again to FIG. 1, in the most preferred embodiment, the present invention includes a cover **28** on top of the bag-receiving hopper **10**. In this instance, the cover **28** is hinged at the back and has a handle **30**, so that it may be easily opened and closed. A cover **28** is a great convenience in minimizing the escape of dust into the surrounding atmosphere when bags are being opened. If the bag is constructed of thick material, it will not be opened until one of the cutting blades **16** is longitudinally moved with relationship to the other as previously described. This operation may be delayed until the cover **28** has been closed, so that the bag will be emptied within a fully-enclosed apparatus.

Also in accordance with the preferred embodiment, conveyor means communicate with a lower portion of the product-receiving hopper **12**. Suitable conveyors include a conventional auger-type conveyor or a flexible tubular-type conveyor **32** such as the one described in a co-pending application, Ser. No. 887,006, filed Dec. 22, 1969, which is assigned to the assignee of this application. Such a conveyor includes an internal, flexible, helical member (not shown), and a central core member (not shown), both of which are driven by a motor **34**.

To operate the apparatus, the cover **28** is first opened, and a bag which it is desired to empty is placed into the bag-receiving hopper **10** and positioned so that it rests upon the cutting portions **18** of the blades **16**. If the bag is relatively heavy and readily tearable, the cutting edges **22** will penetrate into the bag at this time. However, and in case of bags made of heavy material, little or no penetration will occur. The position of the bag is shown in FIG. 3, wherein the bag is indicated in phantom lines, and designated by reference numeral **36**.

The cover **28** is closed, and the operator then grips one of the handles **24** (the right-hand handle in the embodiment shown), and pulls it toward himself to longitudinally displace one of the blades **16** relative to the other. This motion produces an efficient tearing of the bag **36**, and permits the cutting portions to penetrate into the interior of the bag **36**, as shown in FIG. 3. In the case of bags made of a particularly heavy material, it may be necessary to repeat the pulling of one of the handles **24** in order to achieve efficient penetration of the cutting portions **18** into the interior of the bag **36** as shown in FIG. 3.

After the cutting portions **18** have penetrated into the bag **36**, the operator grips the handles **24** and moves their top ends away from one another, rotating the longitudinal bars **20**. This rotation will cause the cutting portion **18** to become separated as shown in FIG. 4, and will allow material to flow from the bag **36** into the product receiving hopper **12**. The conveyor **32** may be employed to immediately convey the material from the bag **36** to the desired location.

After the bag has been emptied, the handles **24** are returned to their original position so that the cutting portions **18** will again be in contact with one another as shown in FIG. 3. The cover **28** is then opened, and the empty bag **36** is removed. The apparatus is now ready for the introduction of another bag of material, which is opened by following the steps previously described.

Although the specific embodiment shown is designed for manual operation, those skilled in the art will appreciate that the bag opener of the present invention may be powered. Thus, suitable power means may be provided for longitudinally displacing one of the blades **16** relative to the other, and for rotating the longitudinal bars **20**. Such power means may include hydraulic, pneumatic, and electrical means. The manner in which such power means may be connected to the apparatus is, of course, familiar to those skilled in the art.

Obviously, many modifications and variations of the invention as hereinbefore set forth will occur to those skilled in the art, and it is intended to cover in the appended claims all such modifications and variations as fall within the true spirit and scope of the invention.

I claim:

1. Apparatus for opening bags comprising: a bag-receiving hopper; a product-receiving hopper positioned below said bag-receiving hopper and communicating with the bottom thereof; a pair of hinged blades positioned in said bag-receiving hopper, said blades having upwardly projecting cutting portions, said cutting portions normally being in side-by-side contact with one another, and being positioned to penetrate into the interior of a bag placed into said bag-receiving hopper, and said blades being hinged to permit said cutting portions to be separated and to allow the material to flow from said bag into said product-receiving hopper.

2. The apparatus as defined in claim **1**, further including means for longitudinally displacing one of said blades relative to the other while said cutting portions are in side-by-side contact.

3. The apparatus, as defined in claim **1** wherein the cutting edges of said blade have an undulating shape.

4. The apparatus as defined in claim **1**, further comprising conveyor means communicating with the lower portion of said product-receiving hopper.

5. The apparatus as defined in claim **1**, further comprising a cover at the top of said bag-receiving hopper.

6. Apparatus for opening bags comprising: a bag-receiving hopper; a product-receiving hopper positioned below said bag-receiving hopper and communicating with the bottom thereof; a pair of hinged blades positioned at the bottom of said bag-receiving hopper, said blades having upwardly projecting cutting portions, said cutting portions normally being in side-by-side contact with one another, and being positioned to penetrate into the interior of a bag placed into said bag-receiving hopper, and said blades having cutting edges of an undulating shape, and said blades being hinged to permit said cutting portions to be separated and to allow material to flow from said bag into said product-receiving hopper; and means for longitudinally displacing one of said blades relative to the other, while said cutting portions are in side-by-side contact.

7. The apparatus as defined in claim **6** further comprising conveyor means communicating with a lower portion of said product-receiving hopper.

8. The apparatus as defined in claim **7** further comprising a cover at the top of said bag-receiving hopper.

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