

Dec. 8, 1959

LAN J. WONG
EVACUATION VALVE CUP

2,916,059

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2 Sheets-Sheet 1

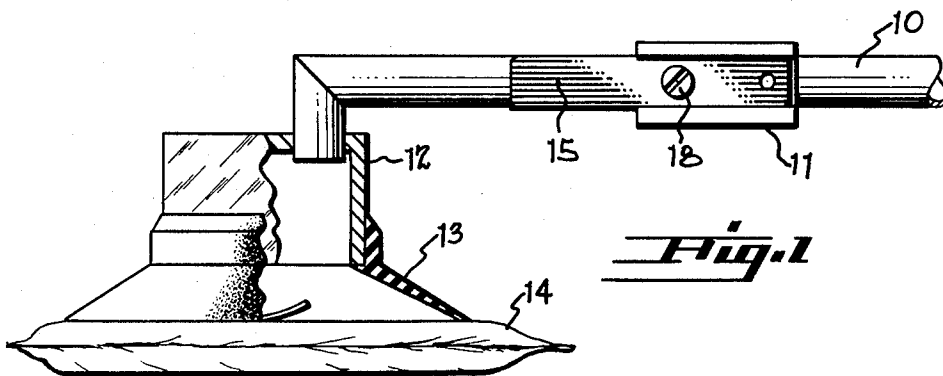


Fig. 1

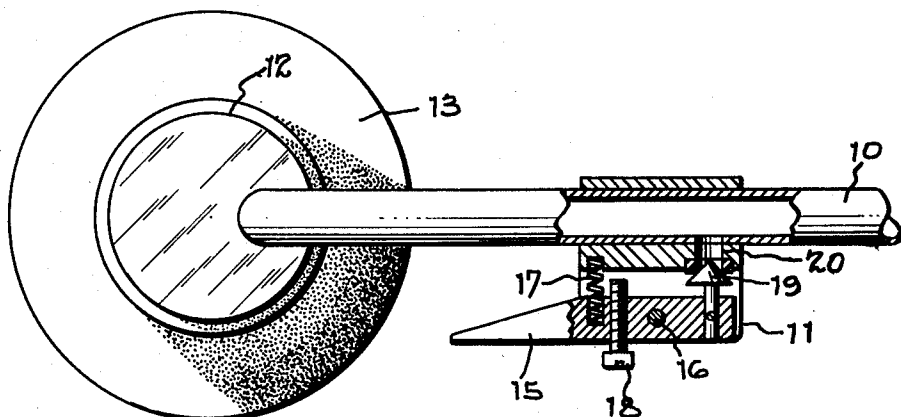


Fig. 2

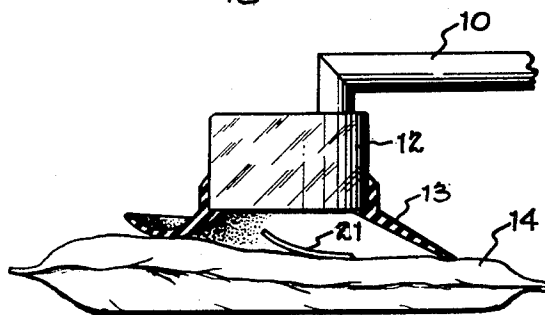


Fig. 3

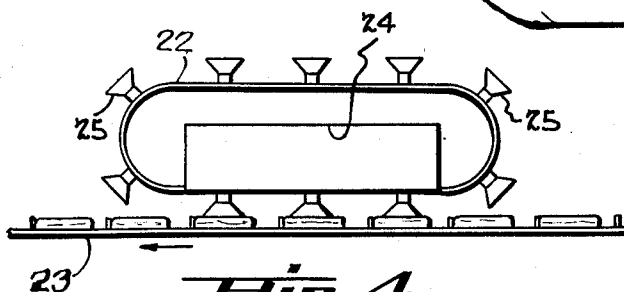


Fig. 4

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2 Sheets-Sheet 2

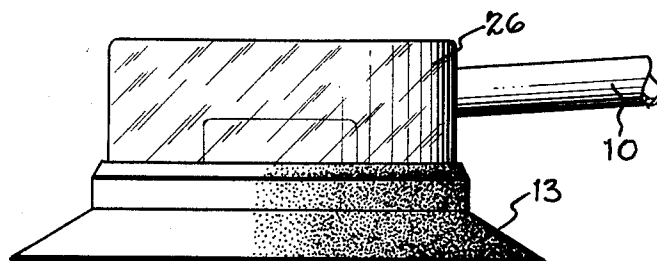


Fig. 5

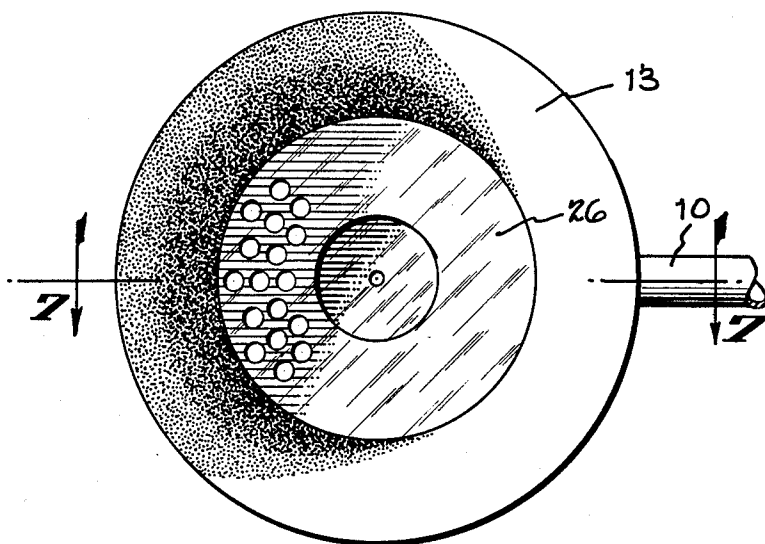


Fig. 6

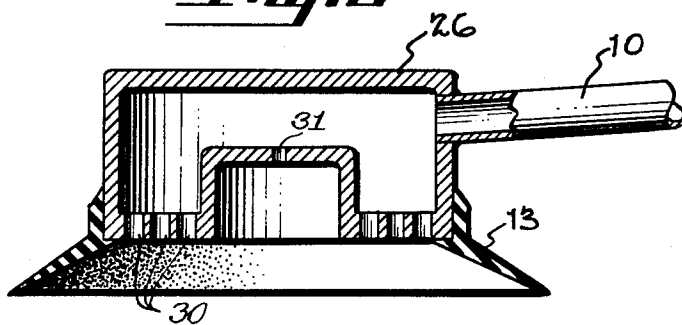


Fig. 7

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2,916,059

EVACUATION VALVE CUP

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2 Claims. (Cl. 141-65)

My invention relates to a plastic bag evacuation valve cup.

The principal object of my invention is to provide a very thin feather edged pliable suction ring for vacuumizing a bag such as a plastic bag.

Another object of my invention is to provide a cup for evacuation of a plastic bag so that the bag wall under the cup area will be lifted from the article contained in the bag.

Another object of my invention is to provide complete evacuation of a plastic bag by providing for deformation of the cup so that the inner diameter of the contact seal ring moves inward, but at the same time, the deformation produces an outward radial wiping effect, which prevents significant crinkling and crumpling of the bag wall into the center of the evacuation cup.

Another object of my invention is to provide an evacuation cup having a conical slope sufficient to accommodate all irregularities occurring with various objects to be evacuated.

Another object of my invention is to provide an evacuation cup having a rubber like cone suction ring readily replaceable.

Another object of my invention is to provide a valve on the air tube to aid in releasing a package at the end of the evacuation.

Another object of my invention is to provide a transparent central cup section which provides for visual location of the cup centrally over the valve on the package.

My invention is particularly useful for evacuation of plastic bags as shown in pending patent applications, Serial Nos. 463,713; 467,977 and 467,978 filed by Melvin R. Metzger. Application No. 463,713 has matured into Patent Number 2,821,338.

In the drawings I show:

Figure 1, the plastic bag evacuation valve cup forming my invention.

Figure 2 illustrates a top plan view.

Figure 3 is a detailed, sectional view, showing the valve cup in operation.

Figure 4 shows a series of valve cups mounted on a belt-drive mechanism.

Figure 5 is a view showing another form of the valve cup.

Figure 6 is a plan view of the evacuation cup shown in Figure 5.

Figure 7 is a detailed, sectional view taken along the line 7-7 of Figure 6.

In general my invention is useful for evacuating a plastic bag having a valve (not shown), which comprises a shield, which is caused to adhere to the bag wall so that a hole provided on the shield is concentric with a hole provided on the bag. A flap is provided which covers a hole on the shield. A cover piece is provided which covers the shield and a flap. By subjecting the valve to evacuation, air inside the plastic bag is forced upward through the holes, causing the flap with a cover piece formed over it to be raised. The cover piece has

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a non-adhesive area which forms a tunnel for evacuation of the air from the plastic bag. This may be more readily understood by reference to the patent applications of Melvin R. Metzger heretofore referred to. When the

package is evacuated the vacuum chamber is opened to the atmosphere, and the air rushing down through the valve, causes the tunnel to be closed. This air pressure causes the valve flap to be forced into the hole, and on to the circular ring of the plastic bag. The main seal is thus effected.

Thus it is very important that there be no crinkling or distortion or deformation of the plastic bag. Prior to my invention when it is was desired to evacuate the valved plastic bags for use with meats, cheeses and poultry, undue pressure on the bag wall by the cup for obtaining a vacuum seal, would cause a seal inside, and thus prevent proper evacuation of the air in the remainder of the package.

By utilizing my invention, the crinkling of the bag surface due to the pulling of the bag by vacuum, with the attendant tendency to break the seal between the cup and the bag wall, is minimized to the extent that maximum evacuation is attainable. By utilizing my invention, we use a very thin feather edge for adequate contact to make a vacuum seal without undue pressure upon the initial contact of the cup to the bag. As soon as the contact seal is made, evacuation commences, and the bag wall is sucked up against the lower surface of the suction ring so that the bag does not contact the articles to be packaged. Therefore, a higher vacuum at all times in the evacuation cup as opposed to the inside of the bag will permit the portion of the bag immediately under the cup area to be lifted.

Referring to the numbered portions of the drawings I show in Figures 1 and 2 an air line 10, supplied with a valve mechanism 11, connected to a clear plastic suction device 12, which has affixed thereto a rubber suction ring 13. A bag 14 is shown. The valve consists of a lever 15, pivoted about a pin 16, against a spring 17, with the downward stop adjusted by means of a screw 18, a conical plug 19 is provided on one end of the pivoted lever, and is adapted to seat within an opening 20, and is resiliently held in position by manipulation of lever 15 about pivot 16. The conical plug 19 is unseated from opening 20 to permit the vacuum to be broken.

Referring to Figure 3 the evacuation mechanism shows the bag 14, sucked up into the cup 13. The cup 13 is of sufficient plasticity to permit its deformation along a portion of its surface. Thus, by reason of the conical slope of the elastomeric section 13, irregularities occurring in the packaging of various objects may be accommodated. By reason of the plasticity of the cup 13, various sized and shaped objects provided with the proper valve

I provide a belt 22, having a series of vacuum cups 25, mounted along its outer surface which are connected to a vacuum chamber 24, and which may be rotated so that the vacuum cups come into selective contact position when packages are passed thereunder. A conveyor belt 23 is provided upon which packaged items are moved. This conveyor belt is mounted with relationship to belt 22 so that the evacuation cups 25 are made to contact the spaced packages on conveyor belt 23.

I show in Figure 5 a hand-operated device, having substantially the same characteristics as shown in the vacuum cup illustrated in Figure 1. This device has a vacuum cup 13, an air line 10, and a member 26, connected to said air line, and provided with a series of holes which connect directly to the suction ring 13, in order to provide for the evacuation of air when said cup is placed over a valve provided in a package. The initial evacu-

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ation is carried out by the outer array of holes 30 which tend to pull the covered section of the bag wall flat against the bottom surface of 26 to prevent crinkling of the bag wall. The evacuation of the bag interior takes place only through the single hole 31 located in the internal cup section of 26 which protects the valve of the plastic bag from being held in a closed position. By reason of the plasticity of the cup 13, the shape of the article packaged in the plastic bag will not affect the sealing action, since the cup will tend to deform itself to conform to irregularities of the packaged item.

It is readily observable that by the utilization of the vacuum cup forming my invention, articles such as meats, cheeses and poultry may be packaged in selected containers having a plastic valve and the containers evacuated regardless of the shape or size or the contents of the package.

Having thus described my invention what I claim as new and useful and desire to secure by United States Letters Patent, is:

1. An evacuation cup for evacuating plastic bags, comprising a transparent cup section and a pliable cone ring having a slope pliability sufficient to accommodate all irregularities on a vacuum bag within the area of the cup and forming a contact seal surrounding an area of said plastic bag to which a vacuum is to be applied, said

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sealed area decreasing in size during the vacuumizing of said pliable bag, said pliable cone ring producing an outwardly radial wiping effect during the vacuumizing process.

2. An apparatus including a plurality of suction or evacuation cups, a continuously moving belt having a linear path of travel, said cups having a central section, a pliable cone ring joining with and surrounding said central section, said pliable cone ring having a cross-sectional thickness which tapers in thickness from its juncture with said central section to a feather edge at its outer periphery, means for mounting said cups on said belt for linear path of travel therewith, means for synchronously moving said belt and said cups and serially contacting said cups with a series of objects such as plastic bags which are to be evacuated and means for serially disengaging said cups from said bags at the end of said linear path of travel of said belt.

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