Oct. 27, 1959 W. H. GENICH 2,910,210

SUCTION PICKER FOR CUP DROPPING MACHINES

Filed March 17, 1958

FIG. 1

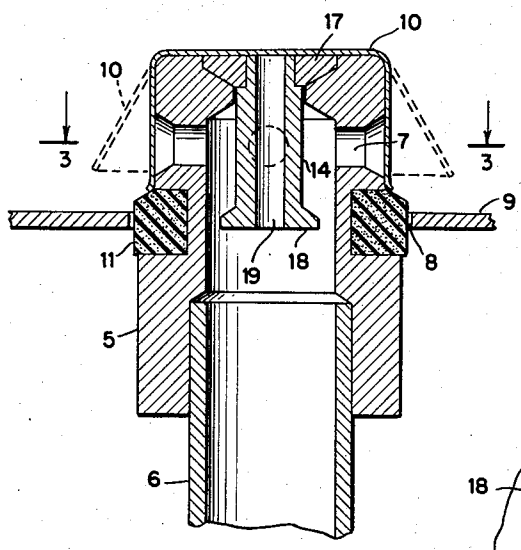
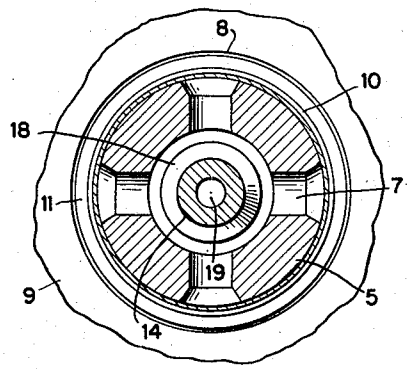


FIG. 3



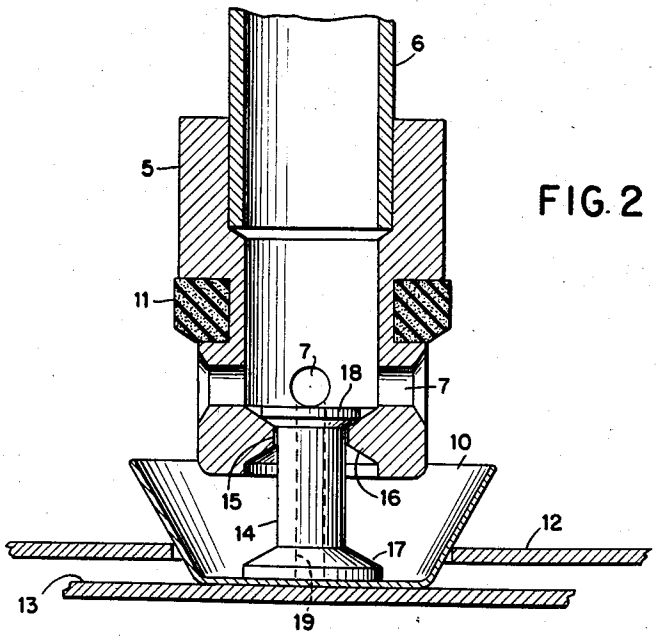


FIG. 2

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SUCTION PICKER FOR CUP DROPPING MACHINES

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1 Claim. (Cl. 221—211)

The invention herein disclosed relates to suction pickers of the type used on cup dropping machines.

Particularly, it is a purpose of the invention to insure that the cups removed from the inverted stacks of cups will be separated and positively dropped from the pickers when suction is released when the pickers are lowered and rotated downwardly into reversed relation.

Further special objects are to accomplish this positive separation with simple automatically operating structure, which will require no servicing and which will continue in effective cup dropping operation, without requiring attention of any sort.

Other special objects are to accomplish these desirable results without complicating structure or operation of the cup dropping machine in any way and realize all advantages mentioned and others, without adding appreciably to the cost of the machine.

Other desirable objects attained by the invention and the novel features of construction, combination and relation of parts constituting the invention are set forth or will appear in the course of the following specification.

The drawing accompanying and forming part of the specification illustrates a present preferred embodiment of the invention, but structure may be modified and changed as regards the immediate illustration, all within the true intent and scope of the invention, as hereinafter defined and claimed.

Fig. 1 in the drawing is a broken vertical sectional view of a suction picker having the invention incorporated therein, in the upper, raised position taking the lowermost cup from a stack of inverted cups in a magazine or other support. In this view the broken lines indicate the normal open position of the cup and the full lines indicate the collapsed position of the cup when suction is applied. In this upper position, the cup ejector is retracted flush in the end of the picker in engagement with the bottom of the cup.

Fig. 2 is a similar view, showing the picker in the lowered reversed position and the cup ejector dropped to positively separate the cup and seat it in the pan, rack or other support.

Fig. 3 is a cross-sectional view on substantially the plane of line 3—3 of Fig. 1.

In the embodiment of the invention illustrated, the picker head is in the form of a tubular body **5**, fixed on the end of a suction pipe **6**, and having suction ports **7**, in the sides of the same.

This picker head is projected up through an opening **8**, in a table **9**, into engagement with the lowermost cup **10**, of a stack of inverted paper cups supported on this table.

When suction is applied, the lowermost cup is collapsed from the position shown in dotted lines to the full line position, reducing its size, so that it may be withdrawn through the opening **8**, in the supporting table.

This collapsing action is assisted in the illustration, by provision of a foam rubber or similar resilient sealing

ring **11**, on the picker head below the suction ports **7**, positioned to be engaged by the rim of the collapsed cup.

After application of suction and collapsed attachment of the bottom cup to the picker head, this head is lowered through opening **8**, carrying with it the suction gripped cup and rotated into the reversed relation shown in Fig. 2, and suction released to drop the cup into a rack **12**, or onto a pan or conveyor **13**, or other support.

Positive release of the picked cup is assured in the present invention by the ejector, here shown as a double-ended plunger **14**, loosely guided through an opening **15**, in the end wall **16**, of the picker head and having annular flanges **17** and **18**, at the outer and inner ends of the same, limiting longitudinal free movement of the ejector in the picker.

The ejector is loosely guided in the opening **15**, and the end flanges **17**, **18**, are shown as bevelled, so as to exert a self-centering effect on the ejector in its free movements in the picker.

The contacting end surfaces are disposed so as to locate the ejector substantially flush with the end of the picker head in the retracted position of the ejector with the picker upright as in Fig. 1, and the ejector extended or projected beyond the end of the picker in the lowered inverted position of the picker, Fig. 2.

Also, it is to be noted that the ejector is of sufficient mass and weight to positively displace and separate the cup from the end of the picker.

Being gravity controlled, the action of the ejector is wholly automatic. As the picker is returned to upright position, the ejector drops back in retracted position, Fig. 1, substantially flush with the end of the picker, where it does not interfere with the suction attachment of the cup to the picker. The ejector in fact may assist in such attachment by having a suction passage therethrough, as shown at **19** and which serves to apply suction direct to the center of the bottom cup. This opening has a double fuction, serving also as a suction relief to the center of the picked cup when the picker is reversed.

The free outward stroke of the ejector may be quite short but preferably is sufficient to guide and to insure positive seating of the cup in the rack. These cups are ordinarily of crinkled or corrugated form, though not so shown in the drawing.

The structure is simple and does not require any operating connections with the dropping machine. The ejectors are practically contained within the pickers and add no bulk or objectionable weight to the pickers. Also, there is only the one moving part and this being loosely confined, gravity actuated, requires no lubrication or other attention.

The invention has the further important distinction of low cost and ready application to present cup dropping machines by simply substituting these new picker heads for those now in use in such machines.

What is claimed is:

In a suction picker for a cup dropping machine of the type in which the picker is raised upwardly into engagement with the bottom of the lowest of a stack of inverted cups, suction applied to attach that cup to the picker and the picker then lowered, rotated downwardly into reversed position and suction released to drop the cup, the improvement comprising the provision of said picker with an end wall having a suction opening therethrough and a double ended gravity operated automatic cup releasing cup loading and cup directing plunger freely operable through said opening, said plunger having beveled flanges at opposite ends located at opposite sides of said wall and the outer flange arranged to seat flush

in the outer face of said end wall so as to engage the bottom of the cup in the raised position of the picker and said plunger having a suction passage extending therethrough from one end to the other whereby to apply suction direct to the bottom of the cup in said raised position of the picker and the flange at the inner end of the plunger being located to permit the plunger to drop into position projecting beyond the end wall in said reversed position of the picker and said loosely guided plunger being of sufficient mass weight in such free falling projecting movement to release and drive the cup

downward off the end of the picker and to direct the expelled cup into position on an underlying support.

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