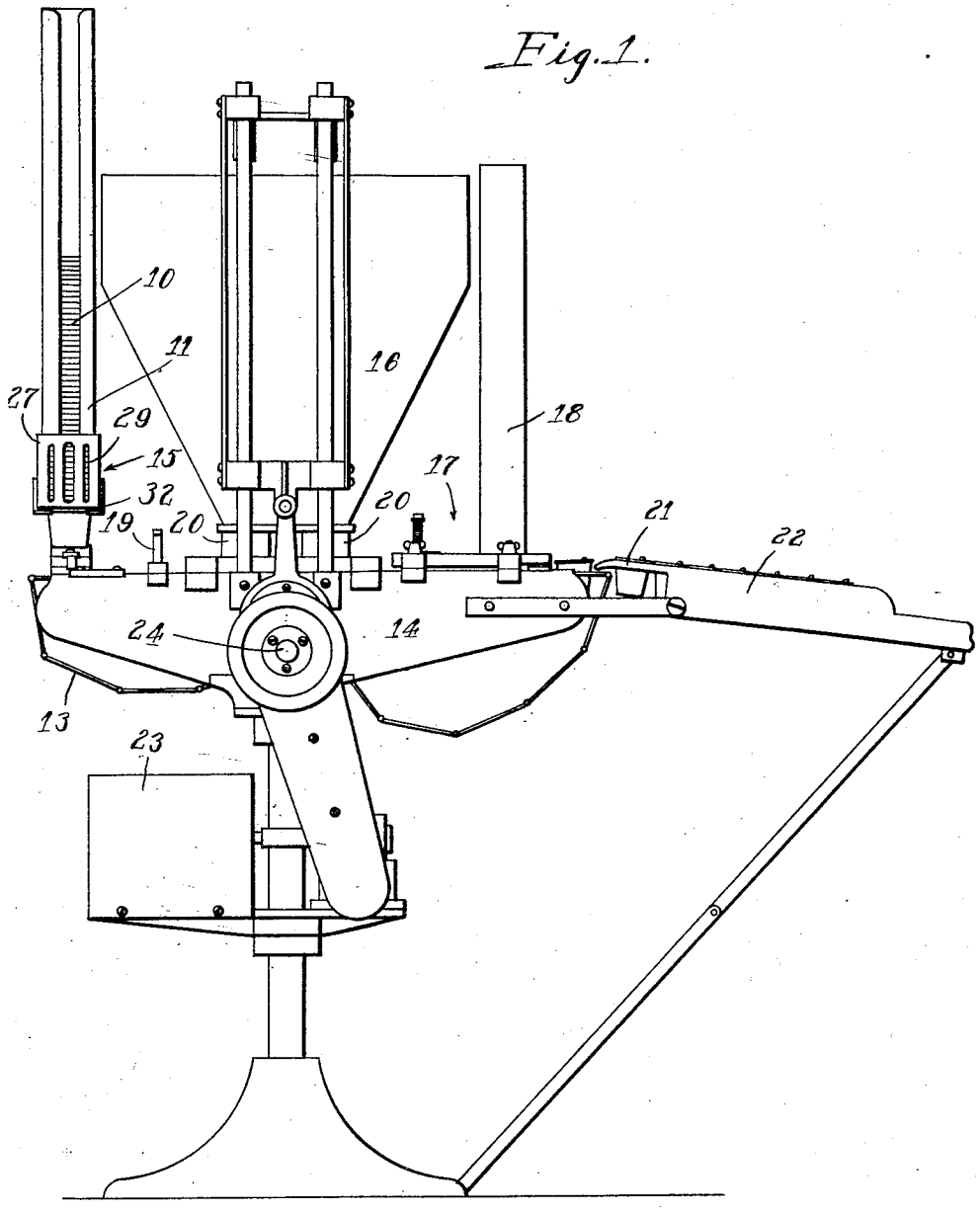
Sept. 11, 1928. 1,683,950

F. L. BORCHERT

CUP DISPENSER

Filed Oct. 22, 1926 3 Sheets-Sheet 1

Fig. 1.



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Sept. 11, 1928. 1,683,950

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CUP DISPENSER

Filed Oct. 22, 1926 3 Sheets-Sheet 2

Fig. 2.

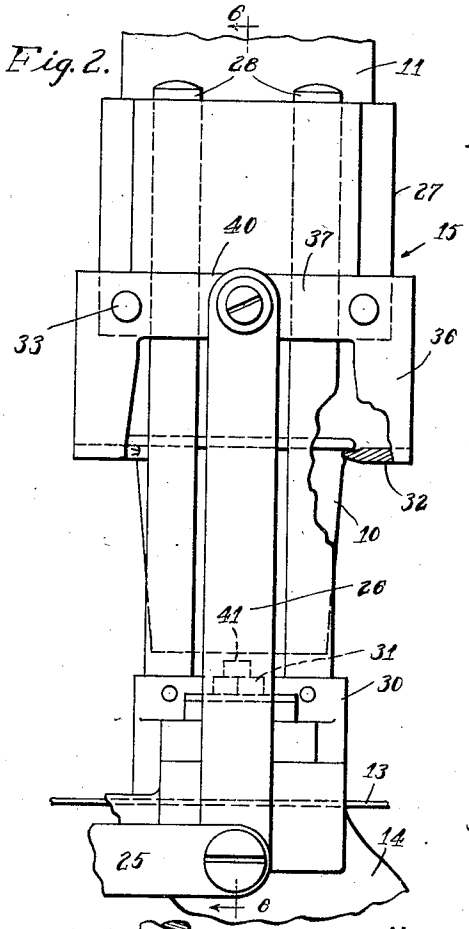


Fig. 3.

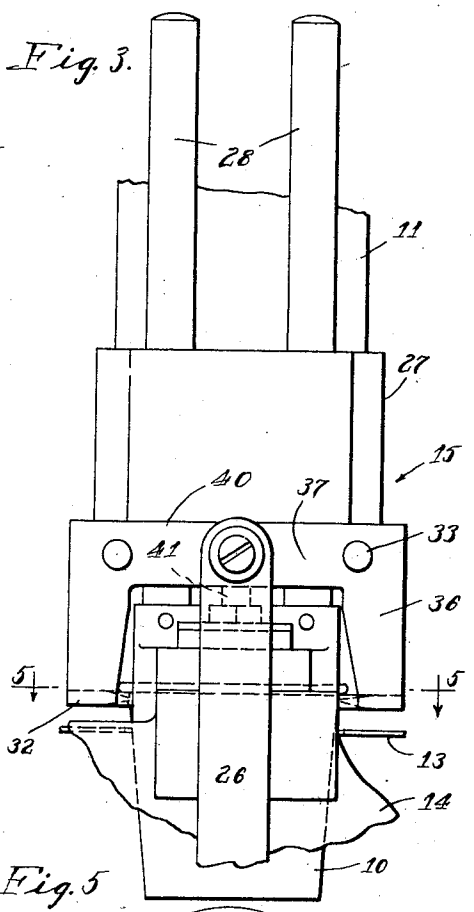


Fig. 4.

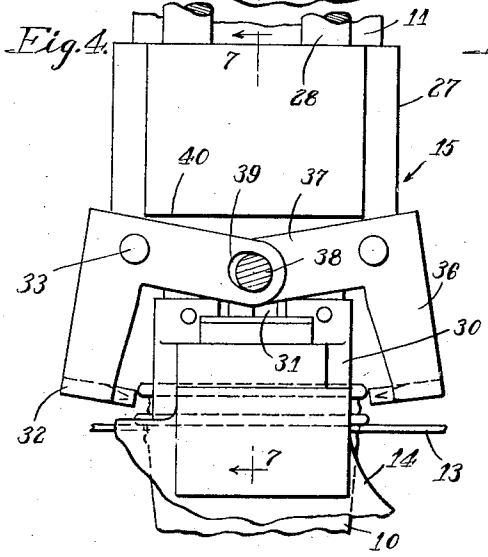
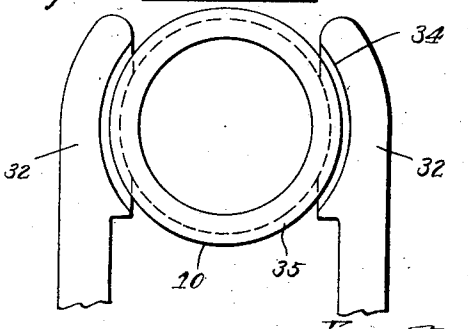


Fig. 5



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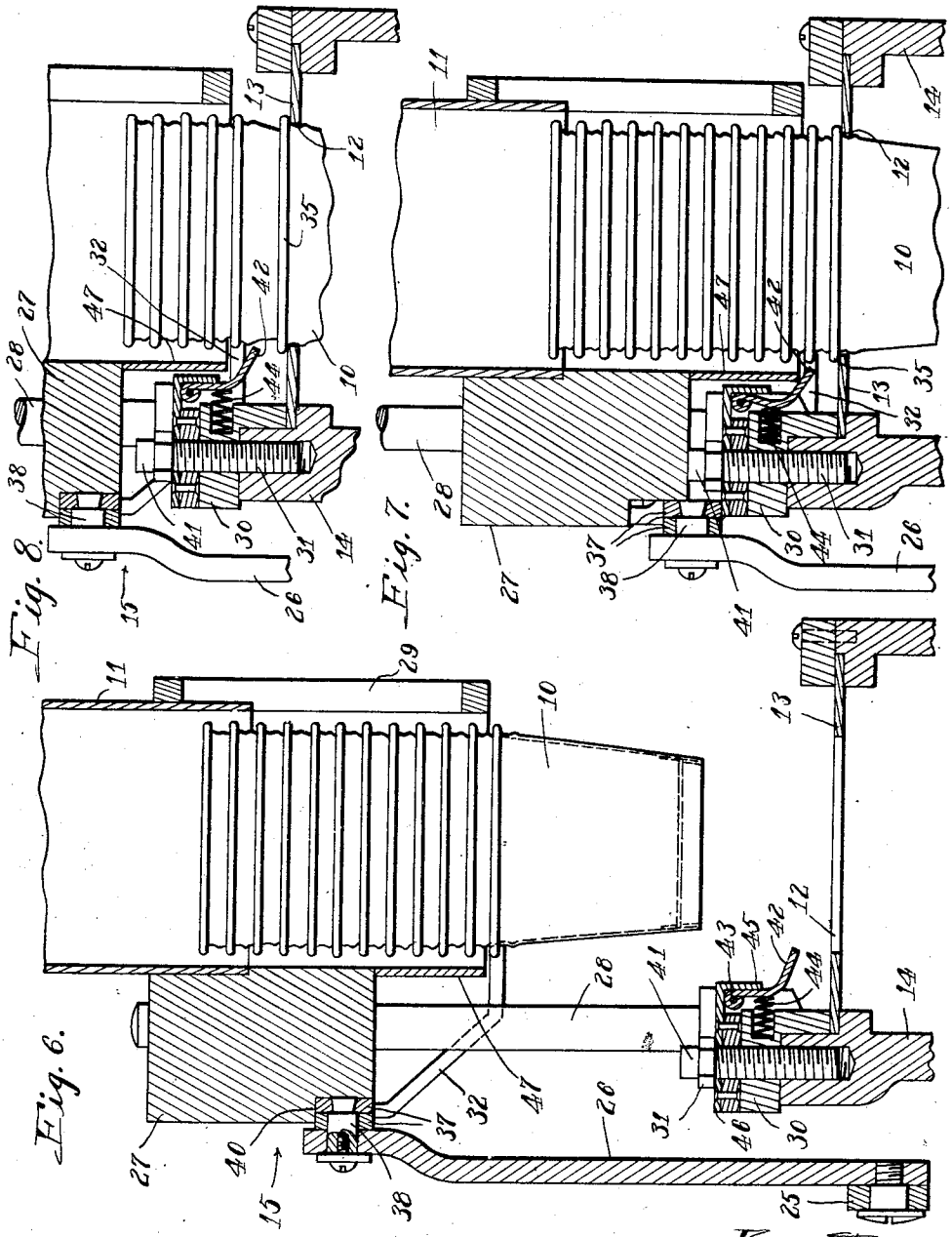
1,683,950

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CUP DISPENSER

Filed Oct. 22, 1926

3 Sheets-Sheet 3



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Patented Sept. 11, 1928. 1,683,950

UNITED STATES PATENT OFFICE.

FRED L. BORCHERT, OF ROCKFORD, ILLINOIS.

CUP DISPENSER.

Application filed October 22, 1926. Serial No. 143,340.

This invention relates to cup dispensers and more particularly a dispenser especially adapted for machine operation for use in automatic machinery, where positiveness in operation as well as the capacity for speedy operation becomes an absolute necessity.

The present device, although not limited to use in connection with an automatic machine such as a filler and capper, is particularly well adapted to the requirements of a machine of this kind by reason of the fact that it will not, under any circumstances, release more than one cup at a time nor will it dispense a second cup to any station of a conveyor. Neither will it fail to supply a cup to any station by reason of the cups sticking to one another. Obviously, a dispenser of this character offers the advantage that there will be no possibility of the machine becoming jammed, which happened whenever a number of cups were fed to one station of the conveyor and fouled with the filling or capping mechanism or some other part of the machine. Nor can there be a loss of material and consequent messing of the machine by reason of the failure of the dispenser to supply a cup to any particular station of the conveyor, which sometimes occurred with the ordinary type of cup dispenser where the cups failed to droop due to their becoming stuck together in the stack.

A further and important feature of the present dispenser lies in the fact that the cups are not dropped singly in a way which would permit of their becoming cocked sidewise and fail to arrive in proper position on the conveyor of the automatic machine, but are directed and guided by moving with the stack into position on the conveyor so as to eliminate any uncertainty as to the proper disposition of the cup when dispensed. This feature is particularly important where quantity production requires speeding up the operation of the machine to the point where as many as 45 cups, or even more, have to be dispensed per minute, under which circumstances the ordinary types of cup dispensers have been found to be impractical and to give serious trouble.

The novel method of operation just referred to permits of the use of a simple means to strip off the dispensed cup from the stack in the event there is any tendency for it to adhere, and also enables the use of a novel means whereby adjustment may be made to adapt the dispenser to operation with cups of slightly different characters.

The invention is illustrated in the accompanying drawings, wherein—

Fig. 1 is a front view of a filling and capping machine equipped with a cup dispenser made in accordance with my invention;

Figs. 2, 3 and 4 are enlarged fragmentary elevational views of the cup dispenser illustrating the method of operation thereof;

Fig. 5 is a fragmentary plan view of the cup gripping jaws with a cup held therebetween and is a view taken on the line 5—5 of Fig. 3 looking in the direction of the arrows; and

Figs. 6, 7 and 8 are sectional views to better illustrate the construction of the cup dispenser as well as to further illustrate the novel method of operation. Figs. 6 and 7 are taken on the lines 6—6 and 7—7, respectively, of Figs. 2 and 4.

Throughout the views the same reference numerals are applied to corresponding parts.

As stated before, the cup dispenser of the present invention is not limited to machine operation but may be manually operated, as in the case of a vending machine. However, I prefer to illustrate the same in connection with a filling and capping machine as shown in Fig. 1, which corresponds to that shown in my copending application, Serial No. 72,618, filed December 2, 1925. As stated in said application this machine makes what are known as packaged sundaes which are individual cups intended for delivery to the ultimate consumer as a handily made-up confection for home or picnic consumption. The cups or other containers used for this purpose are preferably of waxed paper which are relatively inexpensive and intended to be thrown away after they have served their purpose.

Referring to Fig. 1, the cups or other suitable containers 10 are fed one by one from an upright container 11 into openings 12 provided in the plates of an endless linked conveyor or belt 13. The latter is fed step by step from end to end of a frame 14 which constitutes a unitary support for the cup dispenser 15, of which the container 11 forms a part, the cream dispenser 16, and the capping mechanism and cap dispenser 17, which comprises an upright container 18 for caps. For the present purposes it will suffice to state that the cups are supplied one by one from

the dispenser 15 to the conveyor 13 and pass beneath a rider 19 and by keeping the same elevated prevent the stoppage of the machine, as described in my copending application above referred to. After passing the rider the next station reached by the cup is beneath the first of two measuring cylinders 20 from which a measured amount of sherbet is dispensed into the cup, in case the cups are to be filled with sherbet and cream. The next station is beneath the second cylinder 20 from which a measured amount of cream is dispensed sufficient to fill the cup. The filled cup after leaving the cream dispenser is closed with a cap by the capping mechanism at 17 and, in the course of several more step by step advances of the conveyor 13, enters upon fingers 21 extending toward the machine from a chute 22. The filled cups are removed from the chute and placed into cans which are removed to a hardening room. The production of the filled cups proceeds at a rapid rate, as many as 45 or more cups being filled per minute. The motor 23, which provides the power for the driving of the cup dispenser, the cream dispenser and the cap feeding and applying mechanism, communicates power to the main drive shaft 24. Through the intermediary of suitable cams (not shown), oscillating movement is given a lever 25 at the back of the machine to reciprocate a link 26 to operate the cup dispenser 15. From this point on reference will be had more particularly to Figs. 2–8, inclusive, for a more detailed discussion of my improved cup dispenser.

The cup dispenser comprises the upright container 11 preferably open on one side so that the stack of nested cups 10 will be visible to the operator and he can easily see when the supply of cups is nearly exhausted. The container 11 is received in a base portion 27 slidably mounted on a pair of guide rods 28 for movement up and down with respect to the conveyor 13. The base portion 27 is also slotted as at 29 to make the stack of cups visible to the last. The guide rods 28 project vertically and in parallel relation from a block 30 secured, as by means of the bolt 31, to the frame 14 of the machine. A pair of cup gripping jaws 32 is pivotally mounted on the container base 27 as at 33, for movement indicated by comparison of Figs. 2 and 4. The jaws 32 are contoured as at 34 to fit nicely about a cup just beneath the rolled rim portion 35 so as to hold the cup firmly and without crushing. The jaws 32 constitute extensions from the bell crank lever portions 36 by means of which they are pivoted to the container base 27. The bell crank lever portions 36 provide arms 37 extending toward each other, as appears in Figs. 2–4, to be pivotally connected, as shown at 38 with the link 26. The pivot pin 38 is riveted to one of the arms 37 and has capacity for sliding motion with respect to the other in the elongated opening 39 provided therein, as shown in Fig. 4. In this way the jaws 32 may be swung to and from the opened position shown in Fig. 4 by movement of the link 26. The arms 37, when in co-extensive relation, as shown in Figs. 2 or 6, for example, are disposed beneath a shoulder 40 provided on the container base 27. Thus, in the upstrokes of the link 26 the container is moved up by the engagement of the arms 37 with the shoulder 40 but, at the end of the down stroke when the container base 27 comes into engagement with an elongated head 41 provided on the bolt 31 and serving as a stop, the link 26 is free to move with respect to the container base, as indicated in Figs. 4 and 7. This movement of the link with respect to the container base serves to open and close the jaws at the bottom of the stroke of the container in an obvious manner. Thus, the operation of the mechanism, as the description has been so far advanced, will be clear. The jaws 32 by gripping and retaining the lowermost cup 10 of the stack received in the container serves to support the stack. The stack is normally held elevated with respect to the conveyor 13 with the container. When the container is lowered to the conveyor the jaws remain closed until the container arrives at the lower end of its stroke whereupon the jaws are opened by the further movement of the link 26 with respect to the container. The opening of the jaws allows the stack of cups to drop so that the lowermost cup enters and seats in the opening 12 in a link of the conveyor 13. The rim portion 35 seats on top of the link about the opening, as indicated in Fig. 7. In this operation it will be clear that the stack of cups has moved as a solid column and pointed the lowermost cup directly into its opening in the conveyor. The cup was thereby positively directed and guided into place so that there could be no possibility of its becoming cocked to one side or another, as was the case in other types of cup dispensers where the cup was caused to drop an appreciable distance after being released from the stack. Furthermore, when the cup has entered the opening of the conveyor it is squared up properly by the weight of the stack of cups resting thereon. The cup gripping jaws are closed on the commencment of the upstroke of the link 26, as indicated in Fig. 8. The jaws grip the next to the lowermost cup and raise the stack with it out of the cup that has been dispensed. The features next to be described have reference to the provision of novel means whereby it is insured that the cup dispensed will not be picked up with the stack on the withdrawal of the latter, due to the cup sticking or being wedged on the stack, and also to the feature whereby the cup dispenser may be readily adapted to operation with cups of slightly

different characters, as for example where the cups to be used are made of paper of somewhat different thickness which might produce a variation in the spacing of the rims 35 when the cups are nested.

The removal of the lowermost cup from the stack is positively insured by the provision of a stripping dog 42 arranged to intercept the dispensed cup in the event it adheres to and rises with the stack upon the removal of the latter in the raising of the container from the conveyor. The dog 42 is pivoted at 43 to the block 30 and is normally held in the extended operative position shown in Figs. 6 and 8 by a coiled compression spring 44. The dog rests in engagement with a lug 45 provided on a plate 46 when in its operative position. The plate 46, as shown in Figs. 6–8, is held in position with the block 30 by the bolt 31. The dog 42 is arranged to be moved to an out of the way position when the container arrives at the bottom of its stroke so that the stack of cups is perfectly free to drop down to position the lowermost cup in the conveyor. A plate 47 provided on the container base 27 engages the dog 42, as shown in Fig. 7, and moves the same to an out of the way position against the action of the spring 44. However, immediately upon the raising of the container the plate 47 moves away from the dog, as shown in Fig. 8, and the latter is moved out to its operative position in between the lowermost cup and the next cup just above. Then, if there is any tendency for the lowermost cup to adhere to the stack and to be raised with it in the raising of the container, the dog 42 will strip the cup off the stack and retain it in the conveyor. Under ordinary circumstances the dog may not come into play as the lowermost cup will, of itself, remain on the conveyor when dispensed. However, there are times when the cup, due to a possible compression of the stack, has become wedged in the stack and will not become separated so readily in which case the dog will serve the purpose of forcing the cup off the bottom of the stack. Oftentimes the paraffin coating on the cups will cause the cups to stick to one another, especially in warm weather and in that case also the dog 42 insures the removal of the cups one by one as they are dispensed. The dog is sufficiently close to the conveyor so that the cup does not have an opportunity to rise very far out of its opening in the conveyor before it is stripped off the stack. The cups, therefore, drop back easily into place when stripped off and will not be cocked up in an improper position. Thus, there is no likelihood of the machine being jammed by a cup fouling with any part of the mechanism.

The cup gripping jaws 32, it will be clear, operate in a fixed spaced relationship with respect to the lower end of the container 11, or more specifically, the lower end of the container base 27. Thus, when the container is in its lowermost position as respects the conveyor the jaws 32 in opening and closing operate in a predetermined spaced relation to the conveyor. I, therefore, provide the head portion 41 on the bolt 31 of a proper length to provide for a predetermined clearance between the jaws and the conveyor in the opening and closing of the jaws so as to insure proper gripping engagement of the jaws with the next to the lowermost cup of the stack after the stack has been released and is resting on the conveyor. Obviously, the clearance to be left between the jaws and the conveyor will depend on what the distance is between the rims of the cups in the stack. The distance between the rims of the cups in the stack will vary slightly if the cups are made of thicker or thinner stock. By changing the length of the head 41 the container will be spaced differently with respect to the conveyor when it comes into contact with the head 41 and the cup gripping jaws will accordingly operate closer to or farther from the conveyor depending on whether the head 41 is shorter or longer. In this way, it is positively insured that the jaws will pick up all but the bottom cup of the stack at each operation of the dispenser to and from the conveyor. Instead of making a variation in the length of the head 41 it is obvious that the bolt 31 may be provided as an adjustable set screw and having a lock nut to secure the same in its adjusted condition.

It is believed that the foregoing description makes it clear that the dispenser can never release more than one cup at a time under any circumstances. Neither is there any possibility of the dispenser failing to deposit a cup to each station. The present dispenser, unlike any other dispenser of which I am aware, will not repeat the dispensing of a cup to any particular station. In certain cases, as for example where the operator has stopped the machine to make some adjustment or repair and might in so doing turn the conveyor back a step or two, the ordinary dispenser under such conditions would dispense a second cup to one or more stations, which would cause a jam if the machine were allowed to proceed before the operator noticed the trouble and would stop the machine to remove the surplus cups. With the present dispenser there is no possibility of dispensing more than one cup to any particular station. Assume, for example, that the conveyor is turned back so that a station containing a cup is brought beneath the dispenser. In that case, when the dispenser is lowered the stack is entered in the cup already dispensed. The gripping jaws will then pick up all but the lowermost cup so that only one cup will, in any event, be left in any station of the conveyor. The

elimination of all possibilities of jamming arising from the operation of the dispenser makes the present dispenser particularly well suited to use in automatic machinery, especially where a large number of cups have to be handled per unit of time.

It is believed that the foregoing conveys a clear understanding of the objects and possible uses of my invention and while I have illustrated but a single working embodiment it should be understood that changes might be made in details of construction or arrangement without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. In a device of the character described, means to contain a stack of nested cups in a column, a support to receive cups dispensed thereto, said cups to be dispensed one at a time, gripping means normally supporting said column by its lowermost cup in elevated relation to said support, and means to operate said gripping means to lower the column to a position slightly above the support and to then release the column so that the same drops onto the support, said gripping means being thereupon operated by the last mentioned means to grip the column by the second to the lowest cup and to raise the column from said support.

2. A device as set forth in claim 1, including means disposed at such an elevation with respect to said support that it is arranged to engage the top of the lowest cup in the event the same adheres to and commences to rise with the column of nested cups when the latter is raised from the support whereby to strip the same therefrom.

3. In a device as set forth in claim 1, the provision of a part arranged to be changed to vary the distance left between the support and the column of nested cups before the release thereof in the lowered position of the latter whereby to accommodate the device to operation with different cups.

4. In a device of the character described, means for containing a column of nested cups, a support to receive cups dispensed thereto one at a time, and means for gripping and moving the column of nested cups, said means being arranged to lower the column to the support and to release the column and regrip it just above the bottom cup and withdraw all but the bottom cup whereby to insure against the possibility of depositing more than one cup under any circumstances.

5. In a device of the character described, an upright container for nested cups, a support beneath said container arranged to receive the lowermost cup of the stack, a member serving to grip the lowermost cup of the stack and to support the stack thereby, a part connected with said member for raising and lowering the container thereby relative to said support, said part being arranged when moved relative to said container to operate said member to and from open and closed positions so as to cause the releasing and gripping of the stack, and a stop arranged to halt descent of the container when the lowermost cup of the stack is still in slightly elevated relation to said support whereby to permit movement of said part relative to said container to first release the stack and thereafter regrip the same just above the cup resting on the support.

6. A device as set forth in claim 5, wherein the stop is arranged to be changed to vary the distance left between the stack of cups and said support in the lowered position of the stack before the release thereof whereby to accommodate the device to operation with different cups.

7. A device as set forth in claim 5, including means at such an elevation with respect to said support that the same is arranged to engage the rim of the lowermost cup and strip the same from the stack upon the withdrawal of the stack therefrom.

8. In a device of the character described, a frame providing a seat for the depositing of cups one by one thereon, an upright container for a stack of nested cups mounted on said frame for movement up and down, the stack of nested cups therein being thereby also moved up and down with respect to said seat on said frame, means moving with said container for supporting the stack of cups at the bottom thereof, means for positively operating the last means so as to release the stack at the lower end of the stroke of said container, and means at said seat on said frame for engaging the lowermost cup of the stack in the lower portion of the stroke of said container to strip the same from the stack on the upstroke of the container.

9. A device as set forth in claim 8, including means for limiting the downward movement of said container arranged to be changed to permit the lowering of the container to a different extent to suit requirements in the operation of said device with different cups, the operation of said means for operating the cup supporting means being advanced or retarded accordingly.

10. In a device of the character described, the combination of a frame providing a seat whereon cups are arranged to be deposited one by one, an upright container for a stack of nested cups mounted on said frame for movement up and down, the stack of nested cups therein being thereby also moved up and down with respect to the seat on said frame, a pair of opposed gripping devices mounted on and moving with said container serving to grip the lowermost cup of the stack therein and thereby support the stack, said gripping devices being arranged to be opened and closed in a definite spaced relationship to the

lower end of said container, means for operating said gripping devices at the lower portion of the stroke of said container to cause the same to open and release the stack and to close and regrip the stack whereby to withdraw the stack with the container on the upstroke of the latter, and means serving as a stop to limit the downward movement of said container when the same arrives at a position spaced in a predetermined relation to said seat so that the gripping devices in opening and closing also operate in a predetermined spaced relation with respect to the seat on said frame to insure the depositing of only a single cup.

11. A device as set forth in claim 10, including a dog so disposed with respect to the seat that it lies above the rim of the lowermost cup deposited on said seat and is arranged to strip the same off the stack in the event it adheres to and is raised with the stack in the upstroke of the container.

12. In a device as set forth in claim 10, the provision in connection with the seat on said frame of a dog so disposed with respect to the lowermost cup deposited on said seat as to lie in the path of said cup and strip the same off the stack in the event it adheres to and is raised with the stack in the upstroke of the container, said dog being yieldable for movement to an out of the way position when the container is at the lower end of its stroke, and said container having a part to engage said dog to retract the same from operative position.

13. A cup dispenser comprising a frame having a part thereon arranged to receive a cup, an upright container for a stack of nested cups to be dispensed, means on said frame providing a guide for said container for movement up and down, cup gripping jaws pivotally mounted on said container to open and close for releasing and gripping the stack of nested cups, and means for moving said container up and down and for operating said cup gripping jaws whereby the latter stay closed during up and down movement of said container but are arranged to be opened and closed when the container arrives at the lower end of its stroke.

14. In a cup dispenser as set forth in claim 13, the provision of a variable stop for limiting the downward movement of said container to determine the spaced relationship between the cup receiving part on said frame and the cup gripping jaws at the point where the latter open and close whereby to suit the requirements of the particular cups being dispensed.

15. In a cup dispenser as set forth in claim 13, the provision on said frame of a dog serving to get in the way of the cup that has been dispensed to strip the same from the stack in the container in the event the said cup adheres thereto and is raised with the stack in the upstroke of the container.

16. A cup dispenser comprising a frame onto which cups are to be dispensed one by one, a container for a stack of nested cups, means on said frame providing a guide to permit movement of said container up and down with the stack of nested cups therein, a pair of opposed cup gripping jaws on said container pivotally mounted to open and close to release and grip the stack of nested cups, and a reciprocating element for operating said container, said cup gripping jaws having bell crank lever arms pivotally connected with said reciprocating element whereby said jaws are arranged to be opened and closed at the lower end of the stroke of said container but are normally held closed throughout the remainder of the up and down movement of said container.

17. In a cup dispenser as set forth in claim 16, the provision of a stop on said frame serving to limit the downward movement of said container to permit the movement of said reciprocating element with respect to said container to operate the cup gripping jaws.

18. In a cup dispenser as set forth in claim 16, the provision of a stop on said frame serving to limit the downward movement of said container to permit the movement of said reciprocating element with respect to said container to operate the cup gripping jaws, said stop being arranged to be changed to change the point at which relative movement is permitted between said reciprocating element and said container to adapt the dispenser to the requirements of operation with different cups.

In witness of the foregoing I affix my signature.

FRED L. BORCHERT.

CERTIFICATE OF CORRECTION.

Patent No. 1,683,950. Granted September 11, 1928, to

FRED L. BORCHERT.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 5, claim 12, line 23, commencing with the word "In" strike out all to and including the word "strip" in line 27, and insert instead "A device as set forth in claim 10, including a dog so disposed with respect to the seat that it lies above the rim of the lowermost cup deposited on said seat and is arranged to strip"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 23rd day of October, A. D. 1928.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)