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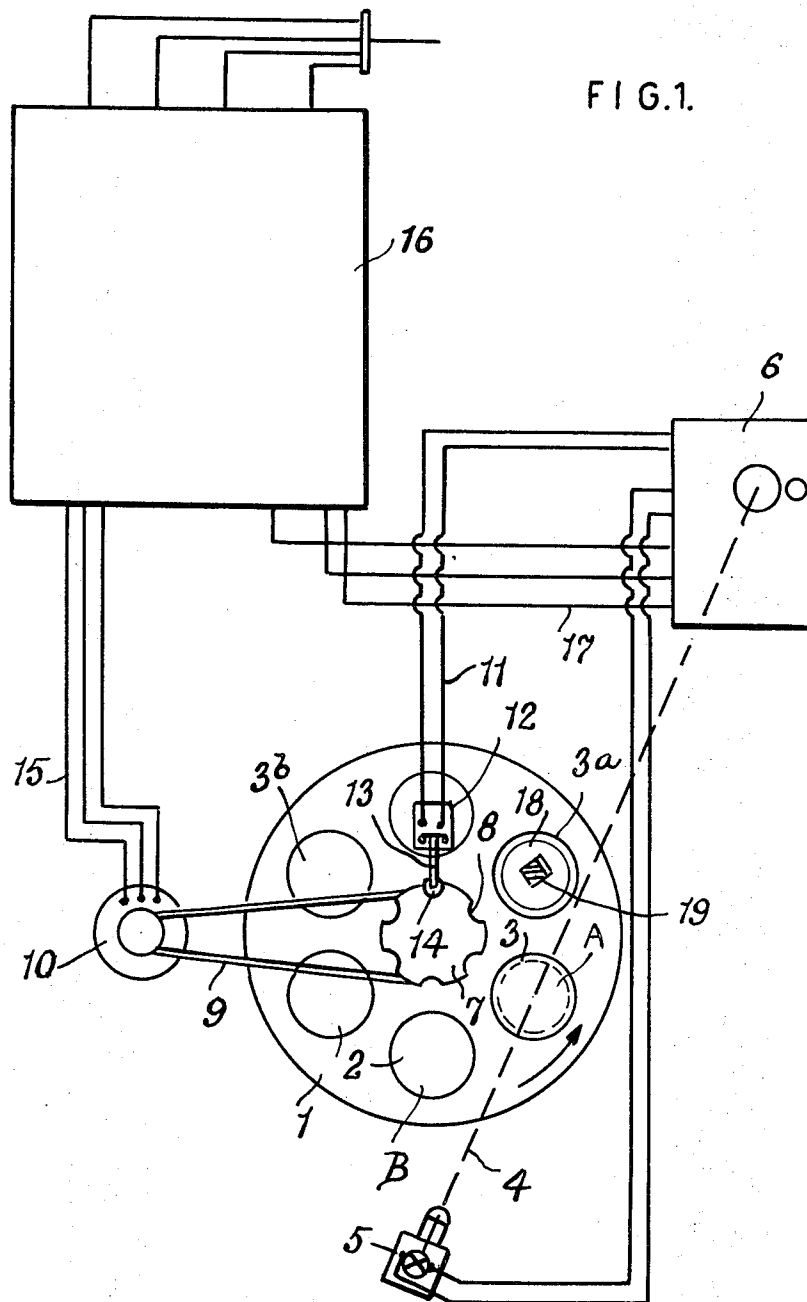
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COMPACTING MEANS FOR THE CONTENTS OF TRASH RECEPTACLES

Filed Nov. 15, 1968

2 Sheets-Sheet 1



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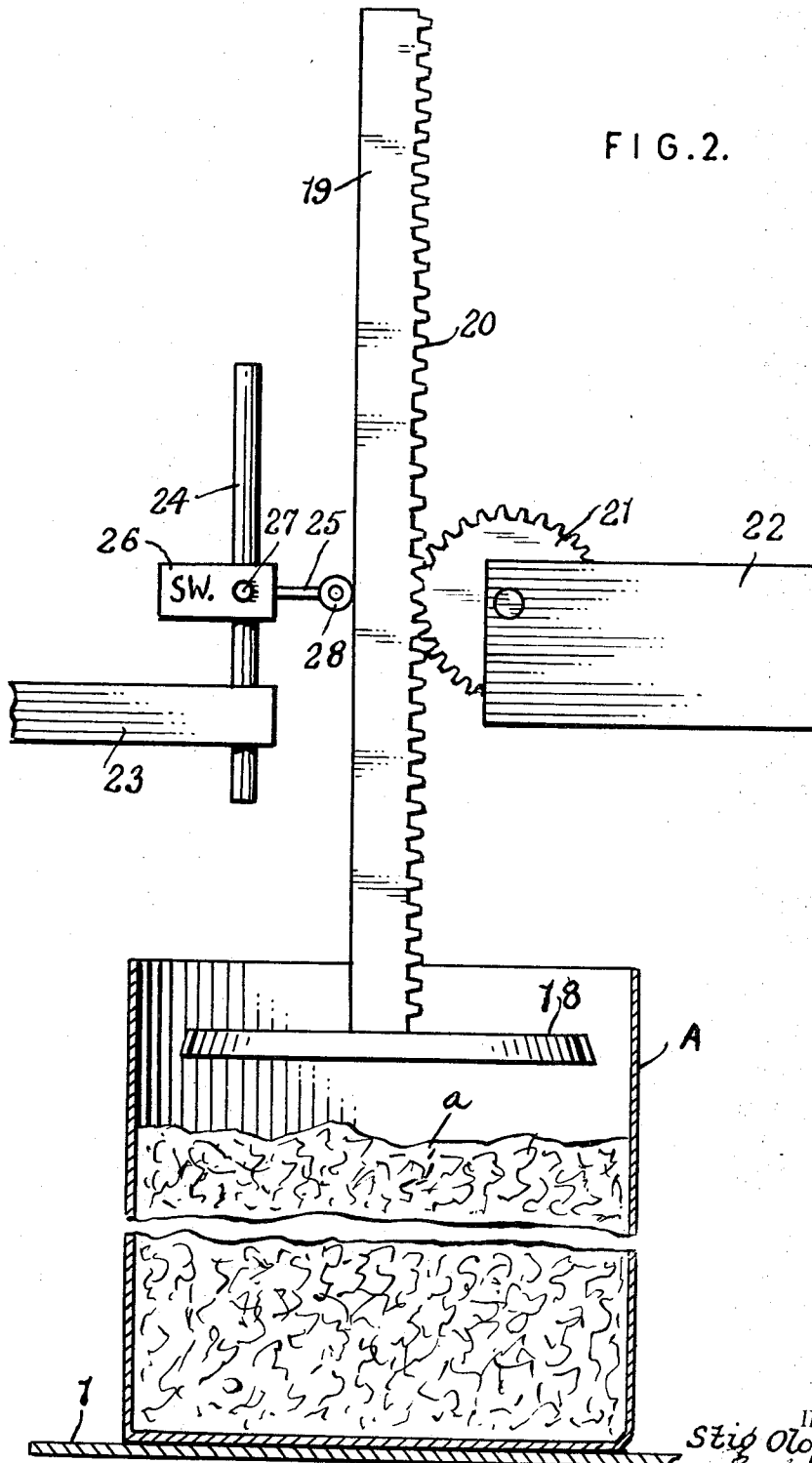
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## COMPACTING MEANS FOR THE CONTENTS OF TRASH RECEPTACLES

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5 Claims

### ABSTRACT OF THE DISCLOSURE

An apparatus for compacting refuse in receptacles which are being successively positioned below a refuse chute for filling, and then moved to a compacting station by a carrier which reciprocates the receptacles between the filling station and the compacting station until the filling operation is completed.

### BACKGROUND OF THE INVENTION

The invention relates to an apparatus for successively positioning empty bags or other types of containers carried by a revolving carrier or turntable beneath a chute, from which the refuse or waste material drops into the bag or container until it is filled and then moved to a compacting station where the refuse is compressed by a compacting head carried by a plunger. This plunger is mechanically driven by a motor via a gear mechanism to move the plunger in and out the bag or container until a predetermined compressive force is reached whereupon the plunger is raised clear of the bag to its starting position. The revolving carrier is rotated by a motor which is controlled by photo electric relay means in such a way as to turn the revolving carrier or turntable after interruption of the light beam for a predetermined time. A time limit switch actuated by the revolving carrier serves to maintain the motor in operation until the bag has arrived at the filling station.

In the devices heretofore used, the carrier or turntable revolves intermittently in one direction. When one bag or container is filled, it is moved by the carrier from the filling station to the compacting station where the refuse is compacted and upon completion of one revolution of the turntable, the bag is returned to the filling station to receive a further supply of refuse then again moved to the compacting station. The turntable with the bags are continually rotated until the bags or other containers are filled. The operation requires the constant attention of the maintenance personnel who must be on the alert to remove the bags when filled and replace them with empty ones.

### SUMMARY OF THE INVENTION

According to the invention the bag or other receptacle is reciprocated between the filling station and the compacting station until it is filled and compacted to the predetermined degree. Thus, when the level of the refuse reaches and breaks the light beam produced by the photoelectric cell, the carrier motor moves the bag to the compacting station where the refuse is pushed down and compacted by the tamper carried by the plunger. After the initial compacting operation the receptacle is returned to the filling station by a mechanism which reverses the movement of the carrier. This reciprocating movement continues until the receptacle is completely filled with compacted waste. The receptacle is thus filled to its maximum with compacted material upon leaving the compacting station. These filled receptacles may be transported along with the carrier and removed at will without requiring any substantial degree of supervision and handling.

In view of the simplified mode of operation, the risk of tearing or other damage to the receptacles is reduced.

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Therefore, receptacles of relatively cheap material, such as paper bags, may be used, which can be disposed of together with the contents without regard to the cost thereof, in view of saving in cost of labor.

Furthermore, the dimension of the carrier can be reduced from that of those now being used, and can have other forms than that of a revolving turntable.

### DESCRIPTION OF THE DRAWINGS

Further objects and advantages of the invention will become apparent from the following description of a specific embodiment and illustrated by the accompanying drawings in which:

FIG. 1 is a plan view of one form of carrier according to the invention and which illustrates diagrammatically the operation thereof; and

FIG. 2 is a skeleton view showing the operation of the compacting device and the reciprocating mechanism for the carrier.

### DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, reference numeral 1 designates a revolving carrier or turntable mounted on a shaft (not shown). The revolving carrier carries six bags 2. One of these bags A is shown disposed beneath the discharge opening of a chute 3. Through the space between the last mentioned bag and said opening, a beam of light 4 is projected by a lamp 5 towards a photoelectric relay arrangement which is of a known type which operates only when subjected to an impulse extending over a certain set period of time. Disposed on the revolving carrier, suitably on its shafts and at a level above the bags is a disc 7 having recesses 8 spaced about its periphery. Beneath this disc there is a pulley (not shown) for a belt 9 extending from an electric motor 10.

Connected to the photoelectric relay arrangement 6 through electric leads 11 is a limit switch 12 having a contact actuating rod 13 provided with a roller 14 which fits the recesses 8 in the disc 7.

The electric motor is connected through electric leads 15 to a motor-control box 16, the latter in its turn being interconnected with the photoelectric relay arrangement 6 through electric leads 17.

The operation of the described means is as follows:

As the bag beneath the chute 3 is filled with refuse up to a level sufficient to provide continuous interruption of the light beam 4, the relay means 6 through the motor control box 16 starts the motor 10 which begins to rotate the revolving carrier 1 through the belt 9 in the direction of the arrow to the compacting station 3a. The disc 7 exerts a camming action on the roller 14 as the disc rotates, so that by means of the roller 14 the contact actuating rod 13 is moved in its longitudinal direction, the limit of movement being reached when the roller 14 is supported by the periphery of the disc 7 between two recesses 8. As a result of this displacement of the contact actuating rod 13 a circuit is closed through the leads 11 which shunts the photoelectric relay means 6 in such a manner that the motor will continue to have current supplied to it and to turn the revolving carrier until the roller 14 engages in the next-succeeding recess 8, which corresponds to the compacting station, whereby the limit switch will stop the motor 10.

Referring to FIG. 2, the bag A has been moved to the compacting station 3a.

The compacting station includes a plunger head or piston 18 mounted at the lower end of a vertical piston rod 19. The plunger, thus consisting of the head 18 and the attached rod 19 is adapted to be vertically reciprocated in suitable guide means to thereby enter through the open mouth of the bag A to compress the contents a thereof to

a required degree. The plunger is then moved upwardly out of the bag to permit the bag to be returned to the filling station 3 by reverse movement of the carrier. The plunger and its guide means, as well as the motor housing 22 are mounted on suitable supports (not shown).

The piston rod 19 is in the form of, or else is provided with, a toothed rack portion 20 that is engaged by a gear 21 driven rotatively from a reversible motor and suitable gearing contained within the housing 22. The gear 21 is arranged to be driven in one direction to bring the plunger downwardly, or in an opposite direction to bring the plunger upwardly at the required times to thus lower and then raise the plunger. This can be done by a reversible motor or by suitable gearing contained in the housing 22.

Extending vertically from a fixed base 23 and parallel to the plunger rod 19 is a fixed rod 24 on which a circuit breaker or delayed action switch is adjustably mounted. It can be locked on the rod 24 at any desired point thereon by means of a set screw 27 or by any other fastening means.

Projecting from the delayed action switch 26 is a rod 25 carrying a roller 28 that is normally forced into contact with the piston rod 19 by means of a suitable spring contained in the housing of the switch and tending to bias the roller 28 toward and into contact with the piston rod.

During the compacting action, the piston 19 descends to such an extent that it passes the roller 28, the rod 27 is pressed outwardly by the spring, and the circuit breaker or switch 26 is connected to the motor 10 of the carrier to cause reverse movement thereof and return the bag A to the filling station to receive additional fill. The delayed action switch serves to delay the return movement of the carrier until the piston 19 has returned to its original position.

The motor 15 is started by an external impulse and imparts a downward movement to the piston 19 via the gear 21 when the bag A arrives at the compacting station.

When a filled bag A reaches a position below the plunger 18 by a halt of the turntable carrying the bags, the plunger then being in a raised position, a suitably located switch sets the motor that drives gear 4, in operation and the plunger and its attached piston rod 19 descend and the plunger contacts with and compresses the contents of the bag A to a predetermined degree.

The device operates as follows:

When the light beam 4 from the photocell 5 is broken by the waste material collected in the bag, the carrier is moved to the compacting station beneath the plunger 18 simultaneously as an empty bag is moved beneath the filling chute. The motor 22 then receives an impulse which causes the plunger 18 to descend and pack the material in the bag. If the material is sufficiently compressible so that the piston 19 descends below the roller 28, the delayed action switch 26 will actuate the motor 10 and return the bag to the filling station for additional fill after the plunger has been raised to a position where it will be clear of the bag. Simultaneously, bag B is removed from the filling station beneath the refuse chute. When the level of the fill in bag A again breaks the light beam, the bag is returned to the compacting station for compacting of the new fill. This operation is repeated until the compacted material reaches the predetermined level corresponding to the maximum fill of the bag. When this level of compacted material is reached, the piston 19 will be above the roller 28 and consequently the circuit breaker will not produce any impulse on the carrier motor. On the other hand, the carrier under the impulse produced by the photoelectric cell will move the bag to position 3b from which it may be removed. Simultaneous-

ly with this movement, the bag B is moved from the filling station to the compacting station and thereafter reciprocated between the two stations in the same manner as bag A.

It should be understood that the invention is not restricted to the specific embodiment described herein, but may find a variety of expressions within the scope of the appended claims.

What I claim is:

1. An apparatus for filling and compacting compressible material in collection receptacles comprising:
  - (a) a movable carrier for supporting said receptacles;
  - (b) a filling station for said receptacles;
  - (c) a compacting station for compacting the contents of said receptacles;
  - (d) motor means for moving said carrier from said filling station to said compacting station;
  - (e) said compacting station including a plunger for entry into and out of said receptacles to compress the contents thereof;
  - (f) means for lowering and raising said plunger in response to a force impulse upon the receptacles reaching said compacting station; and
  - (g) responsive switch means controlled by said plunger effective upon said carrier motor means to reverse the movement of the carrier to return the receptacle to the filling station to receive additional material; and
  - (h) delayed action means effective upon said switch means to delay the reverse movement of said carrier until the plunger has been raised out of the receptacle.

2. An apparatus according to claim 1, wherein the plunger includes a piston rod in the form of a toothed rack, a gear in mesh with the rack and rotative selectively in opposite directions to first lower and then raise the piston, and the switch means being located for circuit closure when the plunger reaches a predetermined lowered position.

3. An apparatus according to claim 2 in which said responsive switch means is adjustable on the piston rod.

4. An apparatus according to claim 2 in which said switch means includes a roller engaging the piston rod for maintaining the switch ineffective to reverse the carrier motor means while the roller is in engagement with the piston.

5. An apparatus according to claim 1, providing means permitting removal of the receptacle from the compacting station immediately upon the receptacle being filled to its predetermined maximum with compacted material.

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WAYNE A. MORSE, JR., Primary Examiner

U.S. Cl. X.R.

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UNITED STATES PATENT OFFICE  
CERTIFICATE OF CORRECTION

Patent No. 3,531,909 Dated October 6, 1970

Inventor(s) STIG OLOF EDEBALK

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

the correct name of the inventor is:

STIG OLOF EDEBALK

Signed and sealed this 6th day of July 1971.

(SEAL)  
Attest:

EDWARD M. FLETCHER, JR.  
Attesting Officer

WILLIAM E. SCHUYLER, JR.  
Commissioner of Patents