

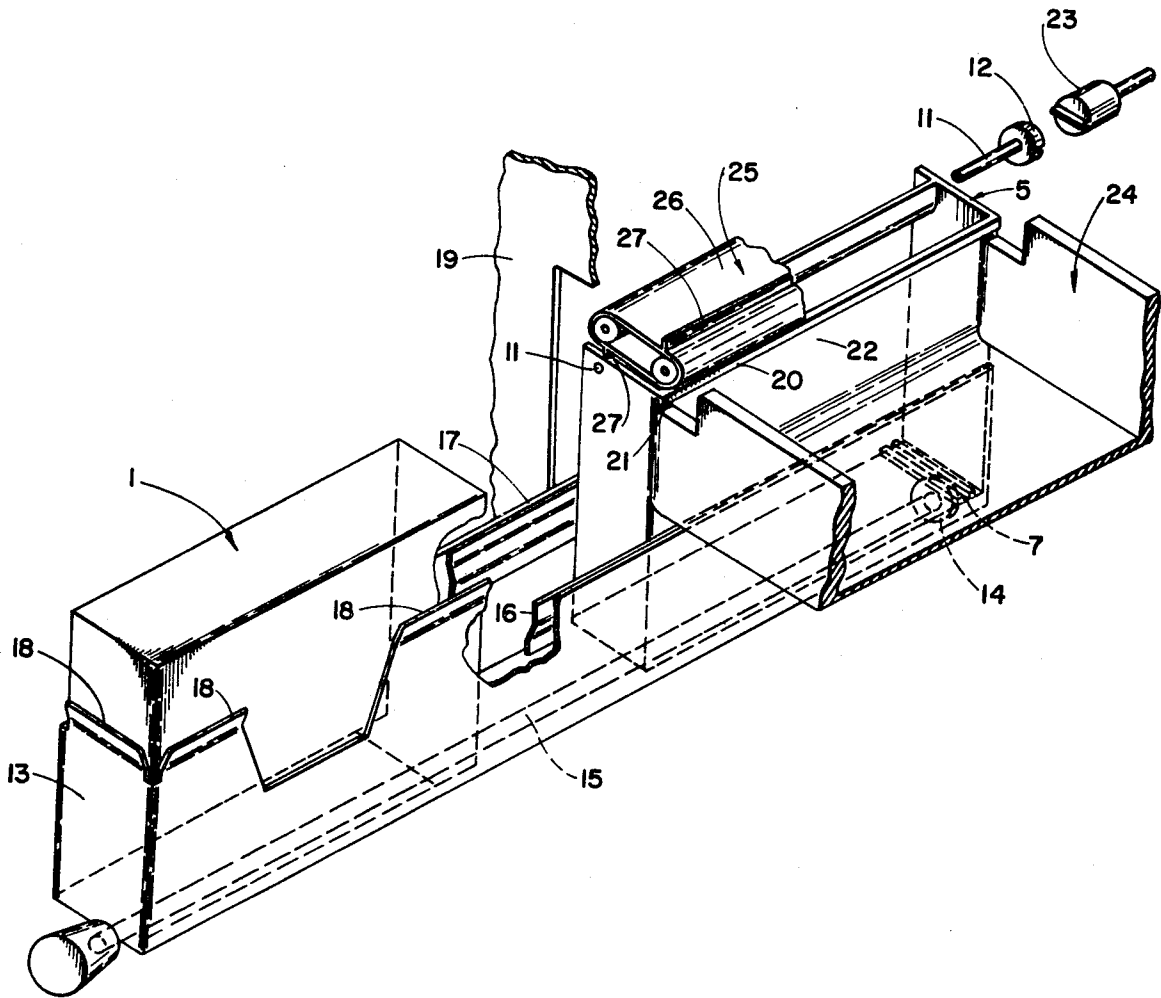
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 [21] Appl. No. **725,785**  
 [22] Filed **May 1, 1968**  
 [45] Patented **Feb. 9, 1971**  
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[56] **References Cited**  
**UNITED STATES PATENTS**  
 3,134,849 5/1964 Frohbach et al..... 222/55X  
 3,249,266 5/1966 Cole et al..... 222/362  
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[54] **APPARATUS FOR HANDLING ELECTROGRAPHIC TONER PACKAGES**  
 6 Claims, 5 Drawing Figs.

[52] U.S. Cl..... 222/179.5  
 222/405  
 [51] Int. Cl..... B67d 5/06  
 [50] Field of Search..... 222/325,  
 99, 354, 363, 362, 366, 55, 179.5, 405 (Inquired);  
 221/80, 81 (Inquired)

**ABSTRACT:** A toner container and dispenser, usable with electrographic apparatus, has an outer cover from which an inner container is mechanically slid to a dispensing position. The inner container has an inside lining restricting the volume of toner in the container and a shaft for taking up the lining thereby making the toner available for dispensing. A rupturable seal is also linked to the shaft to enable opening of the container as the shaft is turned. After the container is empty, it is slid back into the still-clean cover for removal.



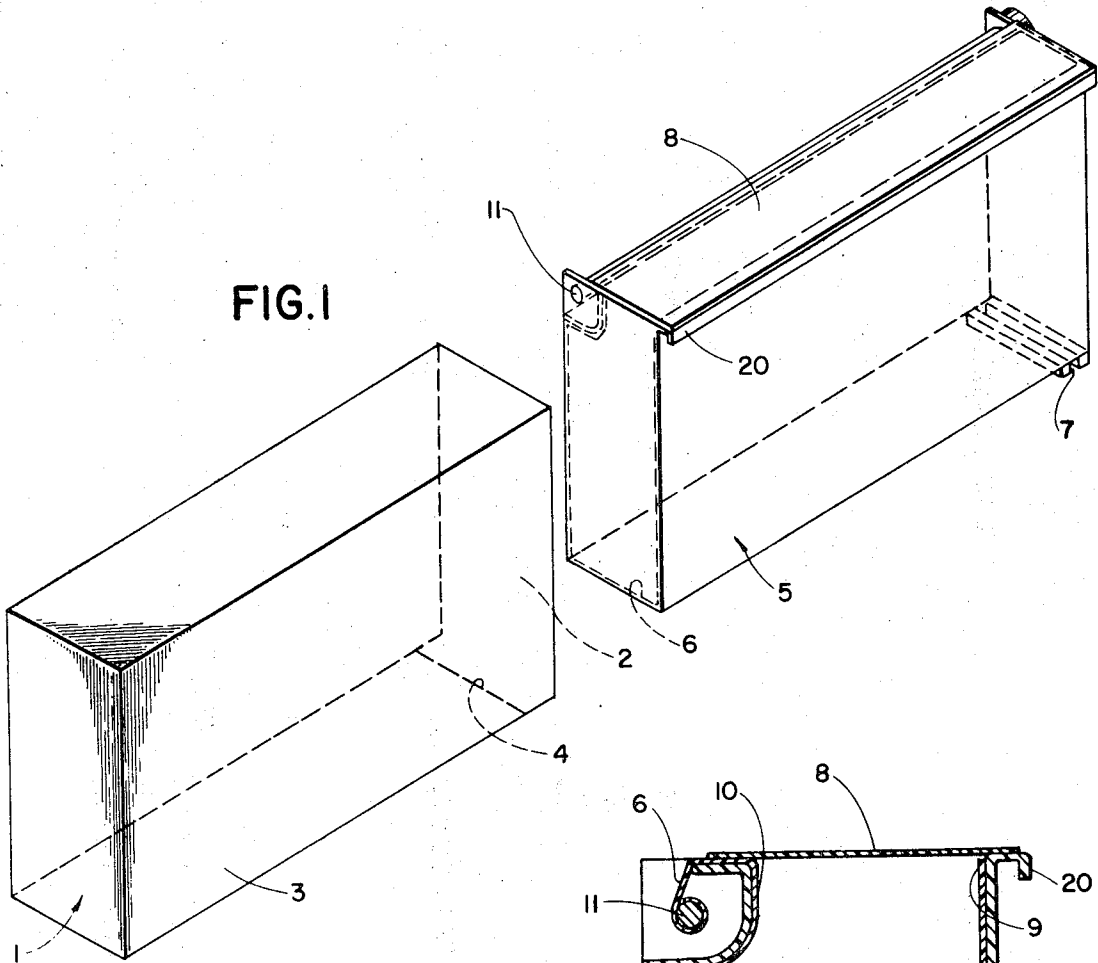


FIG. 1

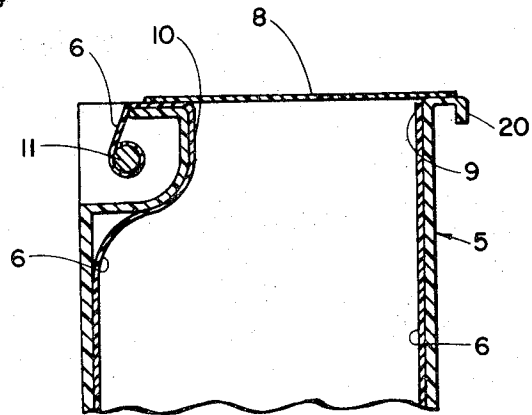


FIG. 2

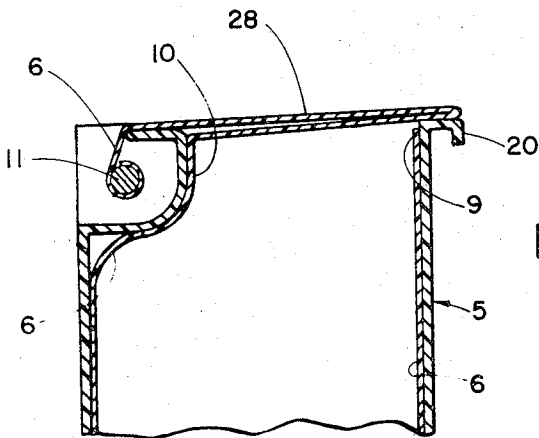


FIG. 3

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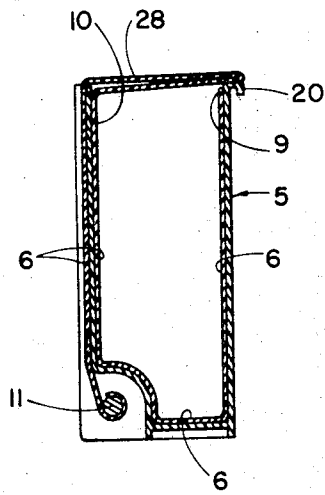


FIG. 4

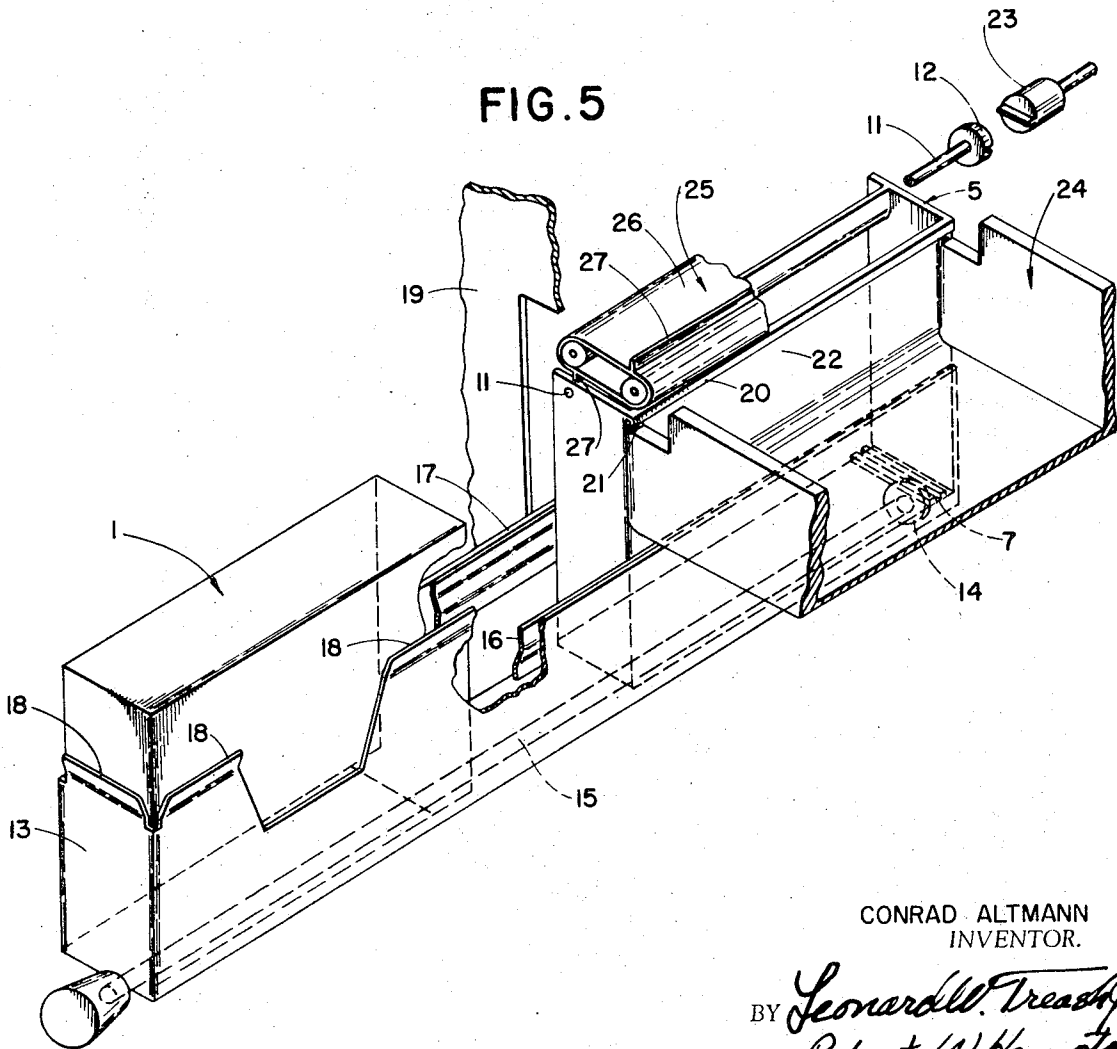


FIG. 5

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## APPARATUS FOR HANDLING ELECTROGRAPHIC TONER PACKAGES

### CROSS-REFERENCE TO RELATED APPLICATION

Reference is made to commonly assigned cofiled U.S. Pat. application Ser. No. 725,810, entitled "Container and Dispensing Mechanism" filed in the names of Conrad Altmann and Donald D. Leenhouts.

### BACKGROUND OF THE INVENTION

This invention relates to toner packaging and handling mechanisms usable in replenishing toner in an electrographic machine.

In electrographic apparatus using dry toner powder, for example, electrophotographic developing apparatus, such toner must be replaced periodically. Common commercial toners present considerable difficulty to handling both because they blacken everything they touch and because they are extremely difficult to thoroughly empty from any container.

Disposable toner containers presently in use are opened by an operator and emptied into a dispensing mechanism in a developing apparatus. Complete emptying of toner from such containers into a dispenser by hand without excessive blackening of person and clothing is a delicate operation in which failure is common.

Many toner containers have been designed which are adapted to be inserted into a machine where they function as a dispensing container. Such devices have the advantage of eliminating a dispensing container as a permanent part of the machine. However, insertion of such prior container-dispensers has commonly involved operator handling of the container in the actual dispensing area with the attendant blackening of his person and clothing. Because of the dual function for such containers, they have been of complex design and expensive to manufacture.

Other toner containers have been designed which, when inserted into a machine, are opened by the machine and emptied of toner into a separate dispensing mechanism. These have an advantage over prior toner containers of reducing the risk to the operator of blackening of his person and clothing on insert. However, such prior containers have generally been of complex design involving complicated couplings with the machine itself and including mechanisms for assuring thorough emptying of the container. Because of such complexities, the container is commonly removed for reuse when empty, with a risk at that point of blackening the operator's person or clothing.

### SUMMARY OF THE INVENTION

The problem of dispensing toner with a minimum risk of blackening the operator's person and clothing is solved with a toner container and cover. The container is slid from the cover into an emptying position by a machine loading device, which engages the container through the cover. When empty, the container is returned to the cover for disposal.

This invention is particularly useful with a container opening and dispensing system, more fully described below to which a cofiled patent application, entitled "Container and Dispensing Mechanism," in the names of C. Altmann and D. D. Leenhouts, Ser. No. 725,810, is directed.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a toner container and its cover.

FIGS. 2, 3 and 4 are fragmentary vertical sections of a toner container illustrating alternative mechanisms for dispensing therefrom.

FIG. 5 is a perspective view illustrating a mechanism for removing the toner container from its cover and a mechanism for feeding toner into a reservoir.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

According to FIG. 1, a rigid boxlike containing means 5 is shaped to snugly fit in a cover 1. The cover has an open end 2. A wall 3 of the cover has a portion 4 next to the open end 2 which is also open. When the rigid containing means 5 is inserted in the cover 1, a groove 7 on the containing means 5 is accessible through the open portion 4 for a purpose described below.

As shown in FIGS. 1 and 2, rigid containing means 5 has an openable end 8, which can be made of an easily rupturable material such as paper. Inside the containing means 5 is a flexible web 6 in the form of a lining which has a concave portion covered by end 8, which concave portion restricts the volume of toner containable by the containing means 5. The web can be a full lining or a partial lining in the form of a ribbon cooperating with sidewalls of containing means 5 to define the toner volume. The flexible web 6 has a portion 9 which is fixed to the rigid containing means at a position adjacent to the openable end 8. A portion 10 of the web 6 is positioned opposite the fixed portion 9 and is connected to a web takeup means, for example, a shaft 11, by an extension of the material making up the flexible web 6. The shaft 11 is journaled for rotation in rigid containing means 5 and includes a coupling member 12 shown in FIG. 5.

FIGS. 3 and 4 show alternative embodiments in which an extension 28 of the flexible lining running from portion 10 to shaft 11 also performs the function of providing the openable top for rigid containing means 5. As shown in FIG. 4, for convenience in certain configurations, the shaft can be placed at the bottom of the containing means 5 thereby providing a larger openable end.

According to FIG. 5, containing means 5 with its cover 1 is placed by an operator into a receiving nest 13 and engagement made between groove 7 and a disc 14 carried on a positioning shaft 15. Receiving member 13 is designed to provide a snug fit with cover 1. As shaft 15 is pushed by the operator, rigid containing means 5 is moved out of cover 1 which is restrained by the snugness of receiving nest 13. Containing means 5 is guided by rails 16 and 17 past a wall 19 which separates the clean area of the machine from a toner dispensing area. A lip 20 on the rigid containing means 5 engages with a top portion 21 of a wall 22 of the dispensing area to assure accurate registration in the dispensing area. Positioning shaft 15 is pushed until coupling member 12 engages with a drive member 23 which is coupled to the drive of an electrographic developing mechanism, not shown. At this position, the rigid containing means 5 is adjacent a developer reservoir 24 and directly under a toner feeding means 25. A preferred form for the toner feeding means 25 is an endless belt 26 having skiving blades 27 positioned to be continually moved across the openable top 8.

In operation, rotation of shaft 11 first opens top 8 by either breaking the paper seal shown in FIG. 2 or pulling the extension 28 of flexible web 6 shown in FIGS. 3 and 4. As takeup shaft 11 continues to turn, the area of the concave portion of the web 6 containing toner becomes smaller thereby reducing the volume available for toner and forcing toner out through now open top 8 where it is skived by skiving blades 27 into toner reservoir 24. A preferred arrangement for feeding toner involves continuously moving flexible web 26 while the development mechanism, not shown in operation. Drive member 23 is then only when toner is needed. According to well-known mechanisms, drive member 23 can be turned in response to a certain number of development cycles or in response to an optically sensed reduction of toner in the toner reservoir 24.

When the lining 6 is pulled taut across top 8, the container will be empty. An operator now pulls shaft 15, replacing containing means 5 in cover 1 which has remained in the clean portion of the machine and can now be thrown away without blackening the hands of the operator.

The invention has been described in detail with particular reference to preferred embodiments thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention as described hereinabove and as defined in the appended claim.

I claim:

1. An electrographic apparatus of the type having a toner supply reservoir, an improved mechanism for handling toner packages of the type having a toner container and a toner cover, said mechanism comprising:

- a. means at a first location in said apparatus for receiving and supporting such a toner package;
- b. means in said apparatus and cooperable with a received package for moving the toner container of a received toner package to a second location proximate said toner supply reservoir while retaining the cover of the package at said first location so as to effect removal of the container from the cover of a received package; and
- c. means for moving the toner container from said second location back to said first location and into covered relation with the retained cover.

2. The invention defined in claim 1 further comprising means, located in said apparatus, for opening a toner container at said second position.

3. The invention defined in claim 1 further comprising means, located in said apparatus, for feeding toner from a

toner container at said position into said toner supply reservoir.

4. In combination with electrographic apparatus of the type having a toner reservoir, an improved toner supply device adapted to utilize a toner package comprised of an interfitting toner container and a protective cover which enclose a quantity of toner, said device comprising:

- a. first means for receiving and supporting such a toner package at a first location in said apparatus;
- b. second means at a second location in said apparatus for supporting the toner container of such a package and for dispensing toner from such container into said reservoir; and
- c. third means for removing the toner container from a toner package support at said first location and moving such container into operative relation with said second means.

5. The invention defined in claim 4 further including means for retaining at said first location the cover of a received package while the toner container of such package is removed therefrom.

6. The invention defined in claim 5 further including means for moving a toner container from said second location back to said first location and into interfitting relation with the retainer cover.

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