

May 28, 1968

E. J. LAVANDER

3,385,500

TONER PACKAGE

Filed April 29, 1966

2 Sheets-Sheet 1

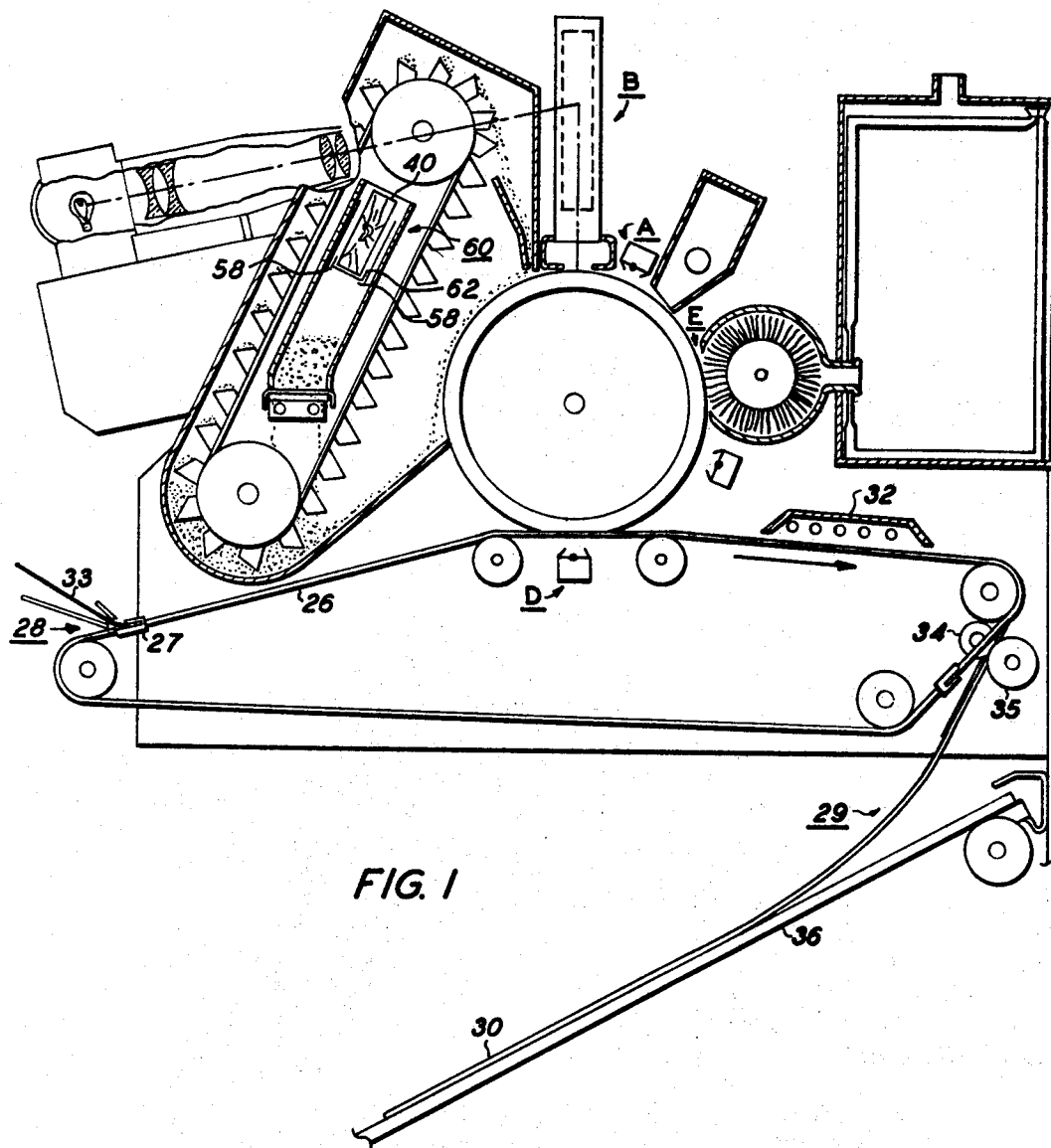


FIG. 1

INVENTOR.
EDWARD J. LAVANDER
BY *Leonard J. Shechter*
Thomas P. Schenker
ATTORNEYS

May 28, 1968

E. J. LAVANDER

3,385,500

TONER PACKAGE

Filed April 29, 1966

2 Sheets-Sheet 2

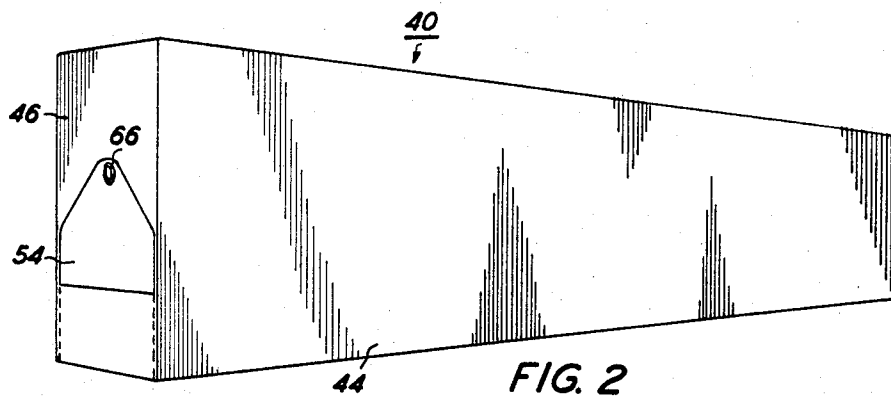


FIG. 2

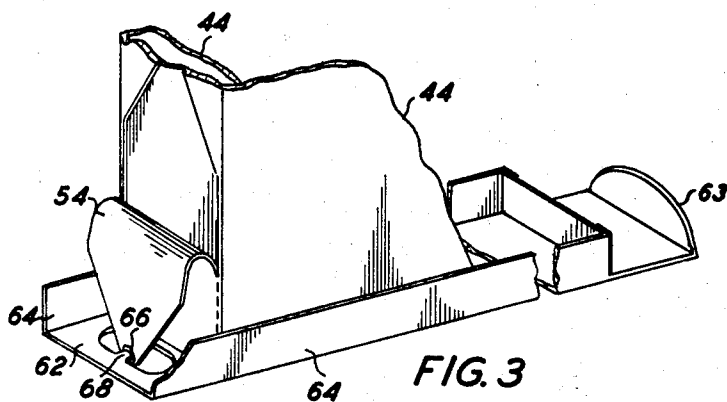


FIG. 3

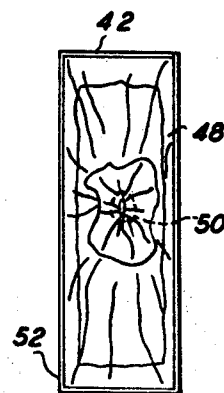


FIG. 5

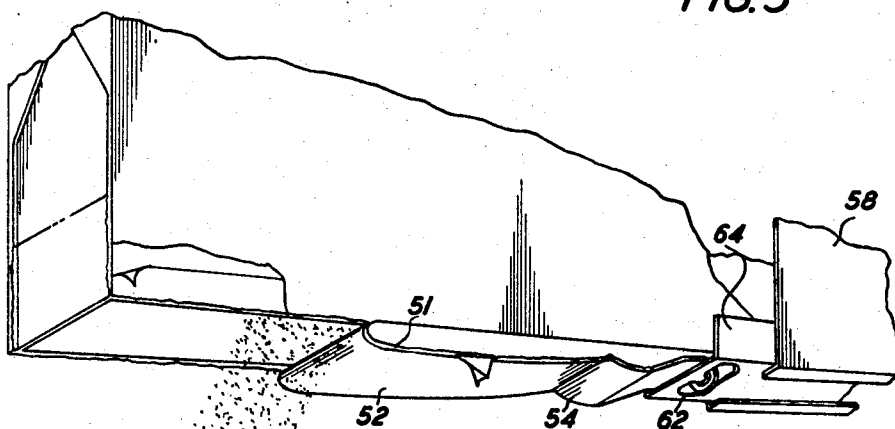


FIG. 4

INVENTOR.
EDWARD J. LAVANDER
BY *Leonard J. Schelter*
James P. Schelter
ATTORNEYS

1

2

3,385,500

TONER PACKAGE

Edward J. Lavander, Irondequoit, N.Y., assignor to Xerox Corporation, Rochester, N.Y., a corporation of New York

Filed Apr. 29, 1966, Ser. No. 546,344

3 Claims. (Cl. 229-7)

ABSTRACT OF THE DISCLOSURE

A toner package having a rectangular body and a separable bottom wall formed of a strip being integral with the body and including a tab portion partially integral with one of the ends for attachment to a stripping mechanism for releasing the toner held in the package and for separating the bottom wall from the body.

This invention relates to a xerographic toner package.

More specifically, the invention relates to a package particularly adapted for use in a xerographic developing apparatus wherein, in order to develop the electrostatic latent image formed on a xerographic plate, it is required to dust the image with a developer powder, whereby the powder particles are selectively attracted to the charged areas of the plate to form a visible powder particle image of the electrostatic latent image.

In the process of xerography, for example, as disclosed in Carlson Patent 2,297,691, issued Oct. 6, 1942, a xerographic plate, comprising a layer of photoconductive insulating material on a conductive backing, is given a uniform electric charge over its surface and is then exposed to the subject matter to be reproduced, usually by conventional projection techniques. This exposure discharges the plate areas in accordance with the light intensity which reaches them and thereby creates an electrostatic latent image on or in the plate coating.

Development of the image is effected with developers which comprise, in general, a mixture of a suitable pigmented or dyed electrostatic powder, hereinafter referred to as toner, and a granular carrier material, which latter functions to carry and to generate triboelectric charges on the toner. More exactly, the function of the granular material is to provide the mechanical control to the powder, or to carry the powder to an image surface and, simultaneously, to provide almost complete homogeneity of charge polarity. In the development of the image, the toner powder is brought into surface contact with the coating and is held thereon electrostatically in a pattern corresponding to the electrostatic latent image. Thereafter, the developed xerographic image is usually transferred to a support material to which it may be fixed by any suitable means.

In the mixture of toner particles and carrier material, the toner particles, which are many times smaller than the carrier particles, adhere to and coat the surface of the carrier particles due to the electrostatic attraction between them. During development, as the powder coated carrier particles roll or tumble over the xerographic plate carrying an electrostatic image of opposite polarity to the charge on the toner, toner particles are pulled away from the carrier by the charged image and deposited on the plate to form a powder image, while the partially denuded carrier particles pass off the plate. As toner powder images are formed, additional toner particles must be supplied to the developer mixture in proportion to the amount of toner deposited.

In order to maintain the proper proportion of toner to carrier in the xerographic system, a toner dispenser is provided therein which adds toner manually or automatically and is manually adjustable to control the re-

plenishing rate. As toner is depleted from the dispenser, it becomes necessary to add toner to the dispenser.

In prior art devices, a permanent box was provided with the dispenser. A slide was provided and held on the bottom of the box. This box was then filled and inserted into the dispenser. The slide was then removed and the toner would fall into the dispenser.

It is therefore an object of this invention to improve the apparatus for adding toner powder or granulated material to a toner dispenser.

Yet another object of this invention is to provide a toner container that is economical and disposable.

Another object of this invention is to improve toner packages that are easy to ship and store prior to use.

Still another object of this invention is to make a toner package that is easy to handle and easy to open.

The present invention contemplates an improvement in dispensing devices wherein an automatic metering arrangement is provided to control the rate of discharge from the dispenser.

These and other objects of this invention are attained by a toner container which can be packaged and which is easily opened by means of a tear strip along the bottom thereof.

For a better understanding of the invention as well as other objects and further features thereof, reference is had to the following detailed description of the invention to be read in connection with the accompanying drawings, wherein:

FIGURE 1 illustrates schematically a preferred embodiment of the invention in a xerographic apparatus;

FIGURE 2 is a perspective view of the toner container constructed in accordance with the present invention;

FIGURE 3 is a perspective view with parts broken away from the container showing how the slide is attached prior to insertion into the machine;

FIGURE 4 is a perspective view of the container showing the action of the slide removing the tear strip; and

FIGURE 5 is an end view of the toner container.

Referring now to FIGURE 1, there is shown a continuous xerographic reproduction machine containing the preferred embodiment of the present invention. The machine is of the type disclosed in Patent No. 3,078,770, issued Feb. 26, 1963, to Hunt et al. The xerographic apparatus comprises a xerographic drum 10 which rotates in the direction indicated by the arrow to cause the drum surface sequentially to pass a plurality of xerographic processing stations.

For the purpose of the present disclosure, several xerographic processing stations in the path of movement on the surface may be described functionally, as follows:

A charging station at which a uniform electrostatic charge is deposited on the photoconductive layer of the xerographic drum is shown at A. An exposure station at which a light to be reproduced is projected onto the drum surface to dissipate the drum charge on the exposed areas thereof, and thereby form a latent electrostatic image on the copy to be reproduced is shown at B. A developing station, where a xerographic drum is developed is shown at C. A transfer station at which the xerographic powder image is electrostatically transferred from the drum surface to the material is shown at D. A drum cleaning and discharge station is shown at E.

In the embodiment shown in FIGURES 1 and 2, the sheet feeding mechanism includes a conveyor 26 which moves in a direction indicated by the arrows carrying one or more paper gripper mechanisms 27 in a circuit between sheet feeding station 28 and a sheet delivery station 29. Means are provided to activate the grippers to cause the grippers to take hold of the front edge of a sheet of support material 30 inserted into the machine at the sta-

tion 28 and to hold the sheet while traveling to the delivery station and there to release the sheet for removal from the machine. In the embodiment shown, a sheet of transfer material is fed manually by an operator to a paper gripper 27 and is forwarded by the paper gripper into contact with a xerographic drum at image transfer station D.

As the paper gripper is advanced by the conveyor, it strips the sheet of transfer material from the drum and transports it to a fixing device, such as a heat fuser 32 where the xerographic powder images previously transferred to the support surface are permanently fixed thereto.

After fusing, the finished copy is discharged from the apparatus at the sheet delivery station 29. To accomplish this, there is provided a pair of delivery rollers 34 and 35 which receives the sheet from the paper gripper and delivers it to a collecting tray 36.

The toner package 40 shown in FIGURES 2-5 consists of a rectangular cardboard body having a top portion 42, side walls 44, end portions 46, 48 and a bottom portion 52. The end portion 48 includes a plastic sleeve which extends out from the container when filling the same. After the container has been filled with a quantity of toner material, the plastic sleeve is closed by gathering the sleeve together tying it by any suitable means such as a band 50. This sleeve is then forced into the confines of the container 40 thereby defining a rectangular container.

The bottom portion 52 of the container defines a removable tear strip which extends along the bottom of the container. The inner portion of the strip is attached to the side walls 44 by a layer of paper that is torn when the strip is removed. This strip 52 includes a tab portion 54 which extends beyond the length of the toner package. The tab portions 54 is turned up and partially secured by the outer layer of paper to the end portion 46 of the toner package. The end portion 46 has a recessed portion 56 formed therein for accommodating the tab portion 54.

To facilitate the addition of toner to the toner dispenser, a pair of guide rails 58 are provided in the toner dispenser 60. A slide or stripping element 62 is stored on the guides 58 in the toner dispenser 60. In order to add toner to the dispenser, the slide 62 is removed from the toner dispenser by a handle 63. The toner package 40 is then placed in the slide 62 within the flange portions 64 of the slide or stripping element 62. The tab portion 54 is provided with an opening 66. The stripping member 62 is formed with an opening at the end thereof and includes a protruding portion 68. The tab portion 54 is of a length such that when the same is turned down as shown in FIGURE 3 the opening 66 can be secured to the protruding portion 68.

The toner package 40 and the slide 62 are then both placed into the toner dispenser along the guide rails 58. The toner package and the stripping member 62 are

shown in this position after they have been inserted into the toner dispenser in FIGURE 1.

The toner package is then held manually or by a suitable clamping element in the toner dispenser and the stripping member 62 is removed from the toner dispenser by the handle 63 thereby pulling or removing the bottom strip 52 from the toner package 40 as shown in FIG. 4. As the bottom strip 52 is removed from the toner package, toner is released from the package 40 and deposited into the toner dispenser.

The toner package is then removed from the toner dispenser and the slide 62 may be re-inserted into the toner dispenser for future use.

It will be understood that various changes in the details, materials, steps and arrangements of parts, which have been herein described and illustrated in order to explain the nature of the invention, may be made by those skilled in the art within the principle and scope of the invention as expressed in the appended claims. However, while the invention has been described with reference to the structure disclosed herein, it is not to be confined to the details set forth, and this application is intended to cover such modifications or changes as may come within the scope of the following claims.

What is claimed is:

1. A toner package having a rectangular body for holding a quantity of toner and including a pair of end walls, a pair of side walls, a top wall, a bottom wall portion integral with the rectangular body, and formed of a strip that is separable from the body, said bottom wall portion being longer than said body and defining a tab, said tab being partially integral with one of the end walls, said tab having means thereon for attachment to a stripping mechanism for separating the bottom wall portion from the body and for releasing the toner held therein.
2. A toner package as recited in claim 1 wherein one of the end portions is formed of a sleeve to be closed for filling and holding the toner within the body.
3. A toner package as recited in claim 1 where said attaching means includes means defining an opening for receiving the stripping mechanism.

References Cited

UNITED STATES PATENTS

2,979,249	4/1961	Gill	229—17
3,187,977	6/1965	Graybill	229—17
3,199,761	8/1965	Hill	229—17
3,262,630	7/1966	Koolnis	229—17

JOSEPH R. LECLAIR, *Primary Examiner.*

R. PESHOCK, *Assistant Examiner.*