April 18, 1961 J C HANSON 2,980,298

MATERIAL DISPENSING APPARATUS

Filed Feb. 18, 1957

Fig. 1

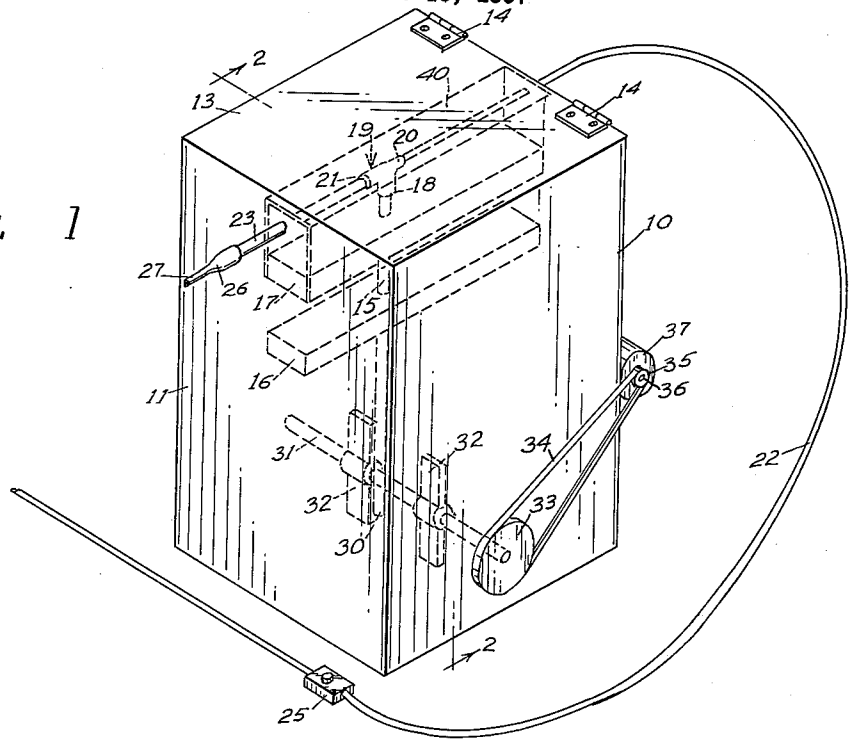


Fig. 2

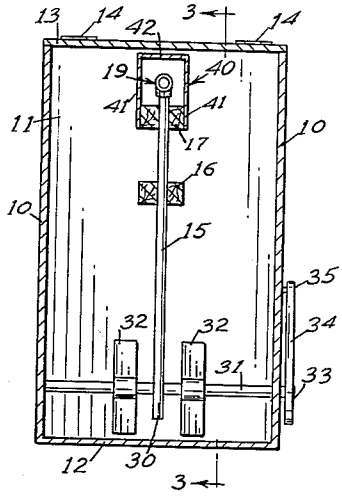
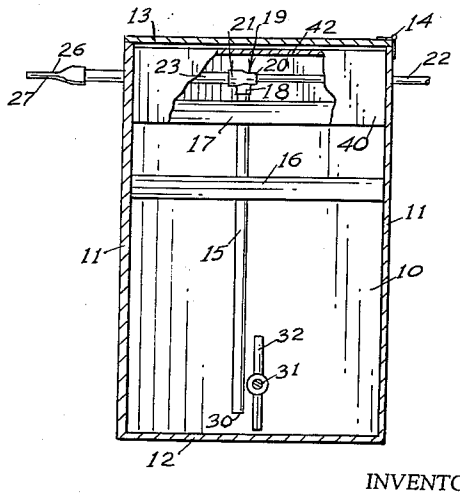


Fig. 3



INVENTOR.

J. C. HANSON

BY

ATTORNEY

United States Patent Office

2,980,298

Patented Apr. 18, 1961

2,980,298

MATERIAL DISPENSING APPARATUS

J C Hanson, 2434 Palmetto St., Montgomery, Ala.

Filed Feb. 18, 1957, Ser. No. 640,768

6 Claims. (Cl. 222—182)

This invention relates to material dispensing apparatus, and is particularly concerned with pneumatic dispensing of particulate material. While the present inventive concept is applicable to a wide variety of fields where various types of particulate material are to be discharged in dry form under pressure, the present form of the invention is particularly adapted for use in the stuffing of toy animals, dolls, cushions and the like with particles of sponge rubber, cork or similar material. However, by the use of an auxiliary flexible discharge tube, the invention is well adapted to meet the demands for discharge of material to remote and inaccessible places, as for instance in sound or heat insulating of buildings where such material is to be introduced between walls and under roofs or the like.

Many devices have heretofore been devised for the discharging under pneumatic pressure of particulate material; however, for the most part such equipment has been intricate, complicated and expensive as to manufacture, upkeep and operation. Some prior art devices of a more simple nature have been designed for use with portable receptacles. However, these prior art devices have not adequately met the increasing demand for a simple unitized dispensing apparatus of a generally stationary nature which is so simple and inexpensive as to fulfill the demands for the stuffing of dolls, toy animals, cushions, pillows, and the like.

In general terms the preferred form of the invention here presented, by way of example, may be broadly defined as comprising a suitable chamber for particulate material in the nature of comminuted sponge rubber, cork, or the like. Transversely disposed within this chamber there is provided an agitating means by which the particulate material may be maintained in a state of motion adjacent an eduction tube. The eduction tube is here shown as leading upwardly to a vertically disposed intermediate outlet of a simple T connection. The T connection is of the type known as a reduction fitting, or reducer, in that one end connection and the intermediate connection are of one diameter while the opposite end connection is of a smaller diameter. Air under pressure is admitted to the smaller end of the T and passes therefrom to the larger end, and outwardly through a discharge tube. The vertical eduction tube is connected with the central passage of the T which thus provides for an aspirating action whereby the particulate material kept in motion at the bottom of the chamber is caused to flow upwardly through the eduction tube and out the discharge tube for delivery to animal or doll forms, pillow cases, and the like. If desired, a flexible tube may be conveniently secured to the end of the outlet pipe for delivering the discharge to inaccessible places so as to provide for the use of the apparatus in sound or heat insulating operations or the like.

One feature of the present invention is to provide a pivotally mounted top closure for the container which facilitates the delivery thereto of the comminuted particulate material and the provision of an encasement for

the T connection, the upper end of the eduction tube, and the internal portions of the air supply and delivery pipes. By this arrangement not only will this area of the structure be prevented from contact with the particulate material which may otherwise damage the apparatus, but it also provides a concealment acting to deter inspection, tampering or damage thereto by unauthorized persons.

From the foregoing it will be seen that the general objectives of the present invention include that of providing a novel and improved pressure actuated dispensing apparatus for particulate material which is simple in construction and operation and well designed to meet the demands of economic manufacture.

Another object of the present invention is to provide a stationary type particulate material dispensing apparatus in which the dispensing of the particulate material is through the aspirating effect of a stream of air which entrains the material for discharge thereof.

A further object of the present invention is to provide, in an apparatus of the character described, an eduction tube for the delivery of particulate material therefrom, together with agitating means mounted adjacent the open receiving end of the eduction tube whereby the particulate material adjacent the eduction tube is maintained in a state of motion so as to assist in the discharge thereof through the eduction tube.

It is also an object of the present invention to provide a novel and simple apparatus for the discharge of particulate material by the aspirating effect of a moving stream of air and to provide for the enclosure of the aspirating fixture, the adjacent air delivery tube, particle delivery tubes and eduction tubes, so as to preclude inspection, tampering or damage thereof by unauthorized persons.

Numerous other objects, features and advantages of the present invention will be apparent from consideration of the following specification taken in conjunction with the accompanying drawing, in which:

Fig. 1 is a perspective view of one embodiment of the invention with the internal mechanism shown in broken lines.

Fig. 2 is a vertical cross-section taken on the line 2—2 of Fig. 1.

Fig. 3 is a vertical cross-section partially broken away taken on the line 3—3 of Fig. 2.

Referring more particularly to the drawings, in that form of the invention here presented by way of illustration, the receptacle of the present structure is illustrated as a generally rectangular box or container comprising side walls 10, front and rear walls 11, a bottom 12 and a top 13 which may be hinged at its rear edge by the hinges 14. The top may thus be readily raised and lowered by pivotal movement for admission of material to be dispensed. While emphasis has here been placed on the use of the invention for the dispensing of particulate material such as comminuted rubber, cork or the like for the stuffing of toys, pillows and such, it will of course be understood that the invention is in no way restricted to this particular use and may be used for the discharge of various types of granular, powdered or particulate material for various purposes.

For the discharge of the material from the chamber, there is provided a vertical eduction tube 15 preferably supported in its vertical position by extension through forward and rearwardly extending brace members here indicated in the form of wooden rectangular pieces 16 and 17 extending between the front and rear walls 11 of the container. The upper end of the eduction tube 15 is received in the vertically disposed intermediate opening 18 of a conventional T fitting 19. The T fitting 19 is preferably characterized by an inlet end 20 of less diameter than the opposite outlet end 21.

In the normal practice of the invention with a container approximately two feet square and three feet high, the eduction tube may be a three-quarter inch pipe while the air intake end 20 of the T connection 19 may be reduced to one-eighth inch. In such case the outlet end 21 of the T may be three-quarter inch.

For discharge of material from the eduction tube 15, air is admitted to the T connection through the end 20 by a pressure air supply indicated by the tube 22, and material is drawn through the eduction tube by aspirating action, to be discharged by entrainment in the stream of air through the three-fourths inch discharge tube indicated at 23. Control of the air supply through the tube 22 may be conveniently provided by a conventional foot controlled air valve indicated at 25. The entrained particulate material drawn through the eduction tube is discharged through the pipe 23 to a nipple 26 which may preferably have a diminishing end 27 for ready insertion within the casing of a toy, doll, pillow or the like, or the smooth outer contour of the end 27 may provide for the ready mounting thereover of a flexible extension discharge tube so that the material from the container may be delivered to remote and inaccessible places, as when the device is used for the discharge of material used in sound or heat insulation.

To maintain the material in a state of agitation at the open end 30 of the eduction tube, so as to insure a steady flow of material under the aspirating effect of air entering the smaller end of the T connection and leaving at the larger end, there is provided a rotatable shaft 31 at the central lower portion of the body 10 of the receptacle. Upon the shaft 31 there is mounted a pair of paddles 32, each adjacent one side of the eduction tube opening 30. It will be noted that the end 30 of the eduction tube is disposed between the paddles 32 in spaced relation to the shaft 30 but adjacent thereto. Rotation for the shaft 31 and its paddles 32 is provided by a pulley 33 over which is trained a belt 34 also trained over a pulley 35 mounted on the motor shaft 36 of an electric motor 37.

An important feature of the present invention is the provision of means for protecting the upper end of the eduction tube, the T connection and the air inlet and material outlet tubes of the device against tampering, inspection or damage by unauthorized persons. Such protection is provided by a cover such as may be formed by a thin metal casing of generally inverted U-shaped cross-section, as indicated at 40. The sides 41 of the cover extend upwardly from the upper brace 17 and are joined by a top 42 which is disposed in slightly downwardly spaced relation with respect to the top 13 of the receptacle when the top is closed.

From the foregoing, it may be seen that when the device is to be placed in operation the cover 13 may be raised and the comminuted or particulate material may be conveniently and simply dropped into the container. The cover 40 protects the upper end of the eduction tube, the T and the associated tubing from damage which might be caused by the indiscriminate dumping of material into the chamber, and the cover further protects the structure from curious and unauthorized inspection or tampering with these vital portions of the apparatus.

When material is to be discharged, the motor 37 is energized to turn the paddles 32 causing the material adjacent the lower outlet 30 of the eduction tube to be maintained in a state of agitation. When the valve 25 is opened to admit air under pressure to the T connection 19, an aspirating effect takes place to draw the particulate material up through the eduction tube and to discharge it in a stream of air through the discharge tube 23 to the nipple 26. The articles to be filled with the material may be placed over the smooth end 27 of the nipple so that the material will enter, the air passing through the fabric or covering of such material, to load such objects with the particulate material. As hereinbefore mentioned, if desired, a flexible hose may be slipped over the smooth outer end of the nipple 27 so that the discharged material may be conveyed to suitable remote or inaccessible points.

It will of course be understood that in the practice of the invention numerous changes, modifications and the full use of equivalents may be resorted to without departure from the spirit or scope of the invention as defined in the appended claims.

I claim:

1. Means for stuffing articles with comminuted resilient material including a receptacle for such material a vertical eduction tube having an inlet centrally within the lower portion of said receptacle, a T connection having a central opening communicating with said eduction tube, and means for applying air pressure to one end of said T connection and for discharging air and comminuted material from the opposite end of said T connection, the outlet opening of said T connection being of greater diameter than the inlet opening and being equal in diameter to that of said eduction tube, together with means for agitating comminuted material within said receptacle adjacent the inlet of said eduction tube, said agitating means including rotary paddles located adjacent and on each side of the lower end of said tube.

2. Means for stuffing articles with comminuted resilient material including a receptacle for such material, a vertical eduction tube having an inlet within the lower portion of said receptacle, a T connection having a central opening communicating with said eduction tube, and means for applying air pressure to one end of said T connection and for discharging air and comminuted material from the opposite end of said T connection, the outlet opening of said T connection being of greater diameter than the inlet opening and equal in diameter to that of said eduction tube, together with means for agitating comminuted material within said receptacle adjacent the inlet of said eduction tube, said agitating means including spaced rotary paddles located on each side of the lower end of said tube, said paddles having a path of motion on both sides of the opening of said tube.

3. A dispensing apparatus including a container, a vertical eduction tube mounted centrally of said container to deliver comminuted resilient material upwardly from the bottom of said container, the entrance to said eduction tube being spaced from all walls of said container, fluid pressure means at the exit of said eduction tube to draw material into said entrance and through said tube and discharge material from said container by fluid entrainment, and material agitating paddles mounted in said container on opposite sides of said entrance of said eduction tube for rotation on a horizontal axis.

4. A dispensing apparatus including a container, a vertical eduction tube mounted centrally of said container to deliver comminuted resilient material upwardly from the bottom of said container, the entrance to said eduction tube being spaced from all walls of said container, fluid pressure means at the exit of said eduction tube to draw material from said container by fluid entrainment, and material agitating paddles mounted in said container on opposite sides of said eduction tube for rotation on a horizontal axis with the path of travel of said paddles straddling said entrance of said tube.

5. A dispensing apparatus including a container, a cover for said container, a vertical tube mounted centrally of said container to deliver comminuted resilient material upwardly from the bottom of said container, the entrance to said eduction tube being spaced from all walls of said container, fluid pressure means within said container below and adjacent said cover at the exit of said eduction tube to draw material into said entrance and through said tube from said container to discharge material by entrainment from said container, a horizontal shaft journalled for rotation by the sides of

said container, a pair of material agitating paddles mounted on said shaft and positioned adjacent the entrance of said tube for rotation on a horizontal axis, said paddles being disposed on opposite sides of said tube with their paths of travel in vertical planes straddling said tube, and means for rotating said shaft.

6. A dispensing apparatus including a container, a cover for said container, an eduction tube extending vertically in said container, fluid pressure means within said container at the upper end of said tube and below said cover for delivering material through said tube from said container by aspiration, and a transversely disposed sealed enclosure for said means within said container and enclosed by said cover.

References Cited in the file of this patent

UNITED STATES PATENTS

2,060,629	McJoynt	Nov. 10, 1936
2,116,725	Jenness	May 10, 1938
2,120,003	Schanz	June 7, 1938
2,274,359	Chater	Feb. 24, 1942
2,487,366	Penno	Nov. 8, 1949
2,587,714	Embree et al.	Mar. 4, 1952
2,653,744	Behr	Sept. 29, 1953
2,696,933	Barclay et al.	Dec. 14, 1954
2,779,510	Wilson et al.	Jan. 29, 1957