Nov. 23, 1971 D. A. DEDIO ET AL 3,621,774

COMPACTING MECHANISM

Filed Feb. 18, 1970 2 Sheets-Sheet 1

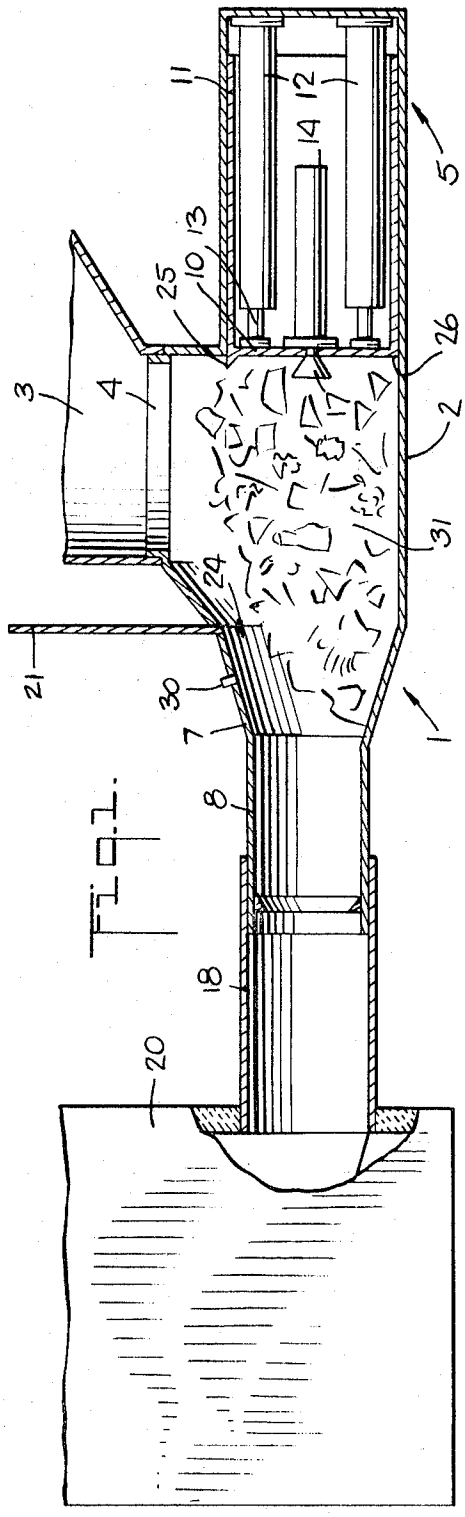


Fig. 1.

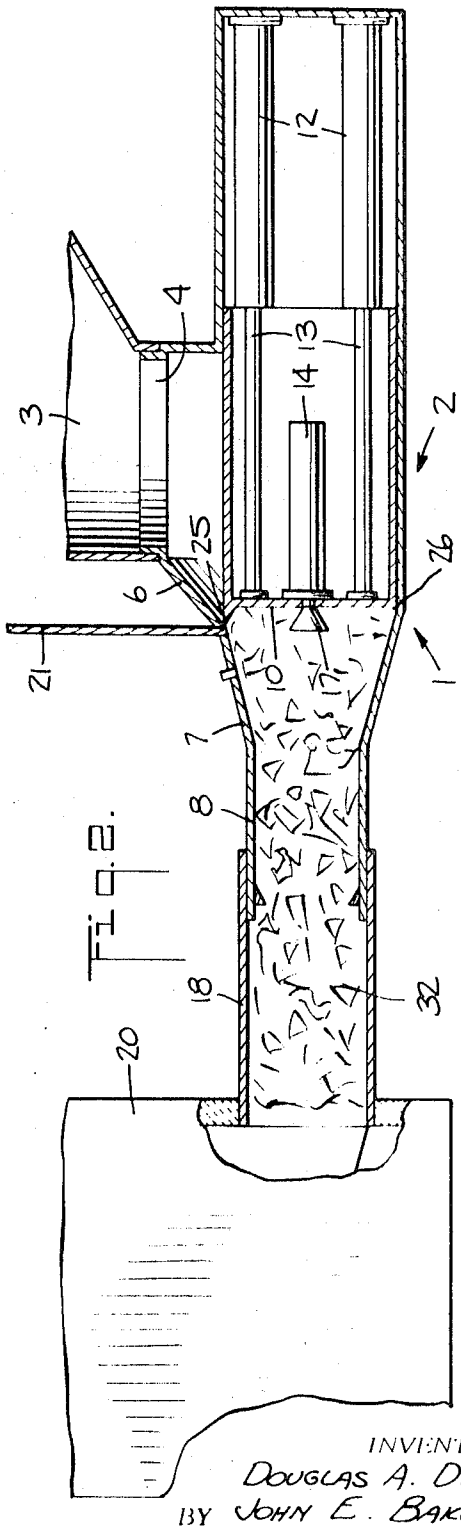


Fig. 2.

INVENTORS
DOUGLAS A. DEDIO
BY JOHN E. BAKER

ATTORNEY

Nov. 23, 1971 D. A. DEDIO ET AL 3,621,774

COMPACTING MECHANISM

Filed Feb. 18, 1970 2 Sheets-Sheet 2

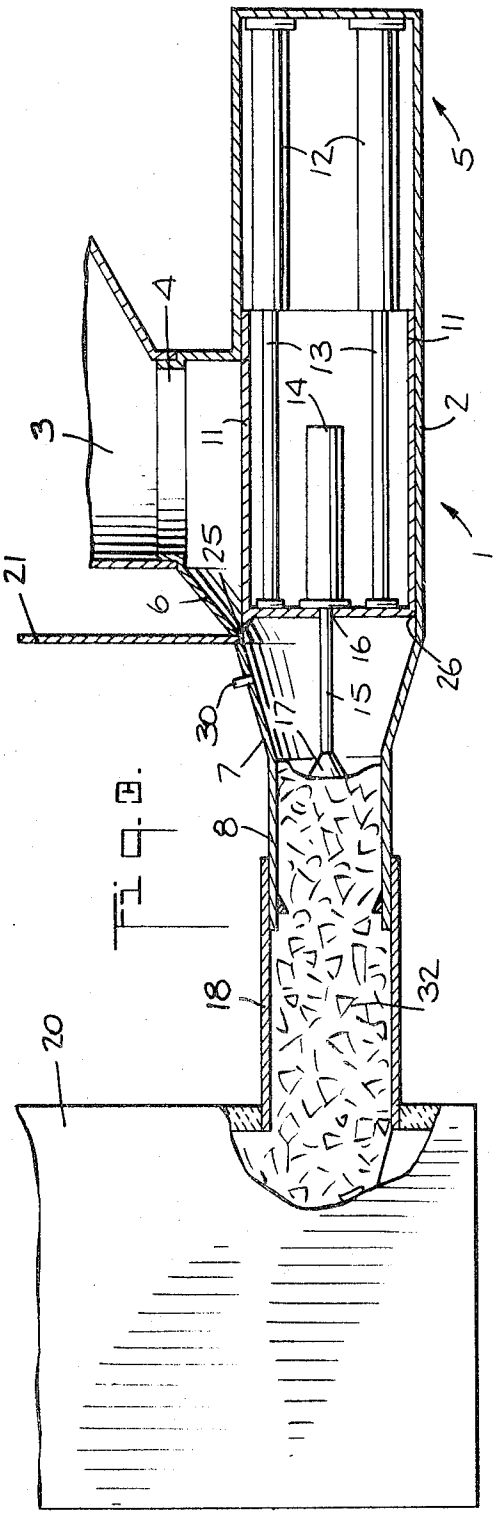


Fig. 3.

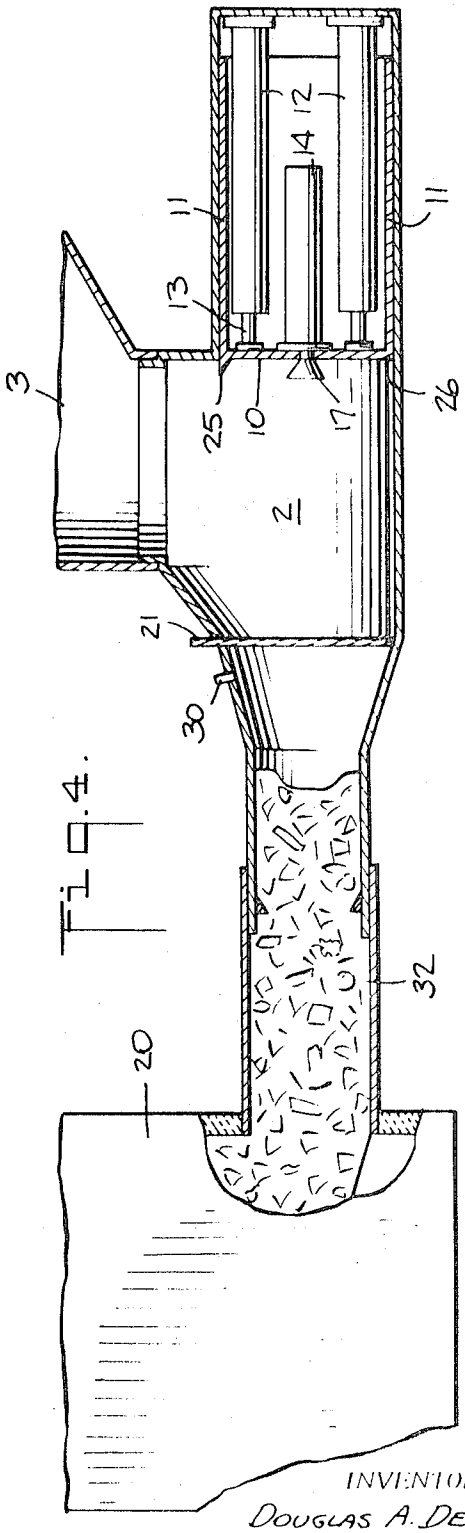


Fig. 4.

INVENTORS
DOUGLAS A. DEDIO
JOHN E. BAKER
BY
ATTORNEY

United States Patent Office 3,621,774
Patented Nov. 23, 1971

3,621,774

COMPACTING MECHANISM

Douglas A. Dedio, Torrington, and John E. Baker, Waterbury, Conn., assignors to Waterbury Hydraulic & Pollution Sciences, Inc., Waterbury, Conn.

Filed Feb. 18, 1970, Ser. No. 12,347
Int. Cl. B30b 1/32
U.S. Cl. 100—74 11 Claims

ABSTRACT OF THE DISCLOSURE

A refuse compacting mechanism which has a sealing gate adjacent its discharge section to seal off the discharge section from the hopper section of said mechanism. When the mechanism is used with a sealed air type incinerator the sealing gate permits incineration to proceed under the controlled conditions existing within the incinerator.

CROSS REFERENCE

This is an improvement over co-pending U.S. patent application Ser. No. 846,542 filed July 31, 1969.

DESCRIPTION

The preesnt invention is directed to an improved compacting mechanism and more particularly to an inexpensive and easy way to maintain compacting mechanism which may be used with sealed air type incinerators.

Compacting mechanisms presently in use utilize means for depositing the refuse, such as garbage, etc., into a receiving chamber. A ram is activated to move the refuse out of the receiving chamber and into a compacting area. When a predetermined amount of refuse has been compacted, it is deposited into a garbage receptacle for removal or into an incinerator.

Heretofore, such mechanisms have not been readily adaptable for use with sealed air type incinerators which incinerate refuse in a controlled environment which is sealed off from the atmosphere. Conventional compacting mechanisms allow a great deal of leakage of air into the incinerator during compacting and charging operations and are neither simple to operate nor maintain. They are also quite expensive and require high hydraulic pressure to operate.

The present invention comprises an improved compacting mechanism which is simple to operate and maintain and is rather inexpensive to manufacture.

Another object of the present invention is the provision of an improved compacting mechanism which does not require high hydraulic pressure to operate.

Another object of the present invention is the provision of an improved compacting mechanism which may be used with sealed air type incinerators.

Other and further objects of the present invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, forming a part of the specification wherein:

FIG. 1 is a sectional view showing the present invention in position to receive refuse;

FIG. 2 is a sectional view similar to FIG. 1 showing the refuse as it is being compacted;

FIG. 3 shows the compacted refuse being directed into the incinerator and;

FIG. 4 is a sectional view showing the present invention during the incineration operation.

Referring more particularly to the drawings, the

present invention is directed to a compacting mechanism 1 which comprises a hopper section 2 which is connected to a chute 3 through an opening 4 at the top. The chute 3 may extend upwardly through a building (not shown) so that when the occupants of the building throw refuse 31 down the chute 3 it will be deposited in the hopper section 2. The rear of the hopper section 2 communicates with a ram section 5. The front end of the hopper section 2 has a tapered transition section 6 leading into a tapered discharge section 7 communicating with cylindrical discharge tube 8. A moveable gate 21 is provided adjacent the discharge section 7 to act as an air seal for that section, as will be described in greater detail below.

The ram section 5 is provided with a main ram 10 having a ram follower 11 extending rearwardly therefrom. The main ram 10 is controlled by a pair of hydraulic traverse cylinders 12. The traverse cylinders 12 are mounted at the rear end of the ram section 5 and have the forward ends of the pistons 13 mounted on the main ram 10. The main ram 10 has a plug cylinder 14 mounted thereon which moves with the main ram 10. The piston 15 of the plug cylinder 14 extends through an opening 16 in the main ram 10 and has the auxiliary ram 17 carried at its forward end.

The discharge tube 8 is adapted to fit into the adapter 18 of incinerator 20 which is preferably of the sealed air type commonly used to control production of pollutants during incineration operation. The adapter 18 contains a refractory lining on its inner surface.

With this construction when a sufficient amount of refuse 31 is deposited into the hopper section 2, transition section 6 and the tapered discharge section 7, the main ram 10 is moved forward as shown in FIG. 2. The ram follower 11 acts as a door to close off the opening 4 in the chute 3 when the main ram 10 is in its forward position.

When the main ram 10 reaches the end of its stroke (when the opening 4 is closed) it begins to push a portion of the refuse 31 through the transition section 6 and discharge section 7 into the discharge tube 8. At this point, the refuse becomes a compacted mass 32 and is ready to be moved through adapter 18 into incinerator 20. The auxiliary ram 17 is then activated and the compacted refuse 32 is pushed into the incinerator 20.

Since the chute 3 is closed by the ram follower 11 of the main ram 10 and the main ram 10 never enters the discharge section 7 the refuse 31 around the main ram 10 will be dragged through the space between the main ram 10 and the transition section 6. Hence, there is no pile up, bridging or jamming of the refuse. This is aided by the fact that the hopper section is much larger than the ram 10.

When the main ram 10 is at its extended position it forms a seal at the mouth 24 of section 7 as seen in FIGS. 2 and 3 by the contact of corner portions 25 and 26 of ram 10 with the inner surface of the compacting mechanism. Therefore it can be seen that the ram 10 and ram follower 11 seals off mouth 24 and also seals the hopper 2 from chute 3 to insure a minimum of leakage of air into the system from the chute 3.

After most of the refuse 31 has been packed into adapter section 18 and the incinerator 20 by ram 17 as shown in FIG. 3, the ram 10 and ram follower 11 must be retracted to their original unextended position so that another load of refuse 31 may be fed into hopper section 2. This presents the problem of air leakage due to opening the seals formed at mouth 24 and between hopper 2 and chute 3 respectively. In order to maintain the sealed condition existing in adapter 18 and incinerator 20, the present invention has a gate means 21 adjacent the discharge section 7 at its mouth 24. When auxiliary ram 17 is retracted the gate 21 is lowered either mechanically or auto-

matically to form a seal. Main ram **10** and ram follower **11** can then be retracted to the position shown in FIG. 4 without causing leakage of air into the incinerator. Gate **21** also acts as a fire wall. Although it is unlikely that a fire would smolder its way back through packed material **28** in the discharged tube due to lack of oxygen, it is desirable to provide a sprinkler type system **30** which would douse the fire with water should this occur.

When more refuse **31** is to be compacted and sent to the chute, gate **2** is raised as shown in FIG. 1 and the ram and ram follower are moved forward to the position in FIG. 2. The operations shown in FIG. 3 and FIG. 4 and described before are then initiated.

It will be seen that the present invention provides an improved compacting mechanism which is simple to operate, maintain and manufacture. The improved mechanism does not require high hydraulic pressure to operate and is readily adaptable for use with sealed air type incinerators.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described our invention, we claim:

1. A compacting mechanism comprising a hopper section for receiving material, said hopper section having side and bottom walls and an opening at the top thereof, a tapered transition section communicating with the hopper section and having an inclined wall adjacent to said opening, a tapered discharge section communicating with the said transition section, a discharge tube mounted in communication with the discharge section and in substantial axial alignment therewith, ram means in substantial axial alignment with said discharge tube and said hopper section adapted to compact said material and move it from the hopper section into the discharge tube, said hopper section being larger than the ram means and said inclined wall being spaced from said ram means to prevent jamming of the material being compacted, and means adjacent the discharge section for sealing the hopper section from said discharge section.

2. A compacting mechanism as claimed in claim **1** wherein the hopper section is substantially rectangular and the tapered discharge section connects said rectangular hopper section with a discharge tube.

3. A compacting mechanism as claimed in claim **1** wherein the opening at the top of the hopper section communicates it with a chute mounted above it.

4. A compacting mechanism as claimed in claim **1** wherein said ram is housed in a ram section communicating with the hopper section.

5. A compacting mechanism as claimed in claim **1** wherein said ram means comprises a main ram and an auxiliary ram.

6. A compacting mechanism as claimed in claim **5** wherein the main ram is propelled by two cylinders mounted in the ram section.

7. A compacting mechanism as claimed in claim **5** wherein the auxiliary ram is propelled by a cylinder mounted on the main ram.

8. A compacting mechanism as claimed in claim **5** wherein the main ram has a follower element adapted to close the opening in the hopper section when it is in its active position.

9. A compacting mechanism as claimed in claim **1** wherein a sprinkler system is provided adjacent said means for sealing the hopper section from the discharge section.

10. A compacting mechanism as claimed in claim **1** in which the ram means seal the hopper section from the discharge section when fully extended during the compacting operation.

11. A compacting mechanism as claimed in claim **10** wherein the ram means also seal the hopper section from the atmosphere.

References Cited

UNITED STATES PATENTS

2,252,697	8/1941	Brassert	100—249 UX
2,780,987	2/1957	Wall	100—249 UX
2,984,172	5/1961	Roberts et al.	100—249 UX
3,209,680	10/1965	McGinnis	100—211
3,295,477	1/1967	McGinnis	100—211 UX
3,303,946	2/1967	Wilkins	214—23
3,303,947	2/1967	Reilly	214—23
3,384,007	5/1968	Boje et al.	100—295 X
3,481,268	12/1969	Price et al.	100—74
3,513,768	5/1970	Altmann et al.	100—295 X

BILLY J. WILHITE, Primary Examiner

U.S. Cl. X.R.

100—179, 190, 229, 249, 269, 295; 214—23