United States Patent

[11] 3,585,781

[72] Inventor **Frank Gordon Blee**
6 Marion road, Upper Montclair, N.J. 07043

[21] Appl. No. **846,054**
[22] Filed **July 30, 1969**
[45] Patented **June 22, 1971**

[54] **DEVICE FOR CONTAINING, COMPACTING AND BALING REFUSE**
20 Claims, 10 Drawing Figs.

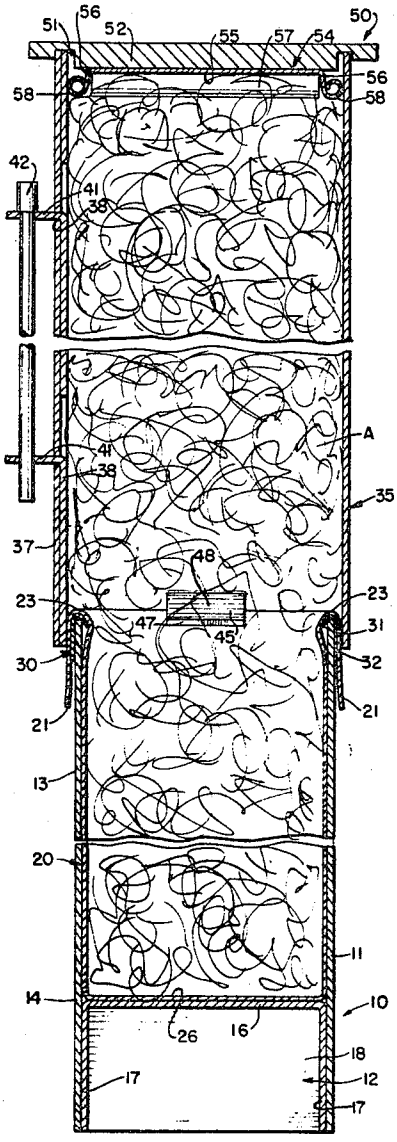
[52] **U.S. Cl.** **53/124,** 53/390, 100/295, 141/73
[51] **Int. Cl.** **B30b 9/00,** B65b 13/20, B65f 1/06
[50] **Field of Search** ..... 53/24, 124 A, 124 B, 124 E, 124, 390; 100/34, 229 A, 295; 141/12, 73, 80

[56] **References Cited**
UNITED STATES PATENTS

2,763,973	9/1956	Atkins	53/24
3,438,321	4/1969	Gladwin	53/124
3,527,161	9/1970	Brown et al.	53/124 X

Primary Examiner—Theron E. Condon
Assistant Examiner—Neil Abrams
Attorney—Burgess, Ryan and Hicks

ABSTRACT: The device comprises a box and a tubular slide telescoped over said box and adapted to be supported on this box in extended position to form with this box a container for refuse. A removable bag lines the box and a ram is adapted to be placed over said slide to cover said slide when the container is filled. With the slide covered by the ram, the means mounting the tubular slide in extended position is released and the ram covered slide is pushed down over the box to compress the refuse, until the slide reaches a position in which the refuse has been all compressed and is contained in the bag lining the box. The bag can be closed to form a bale, and this bale can be removed from the box.



PATENTED JUN 22 1971 3,585,781

SHEET 1 OF 3

FIG. 1

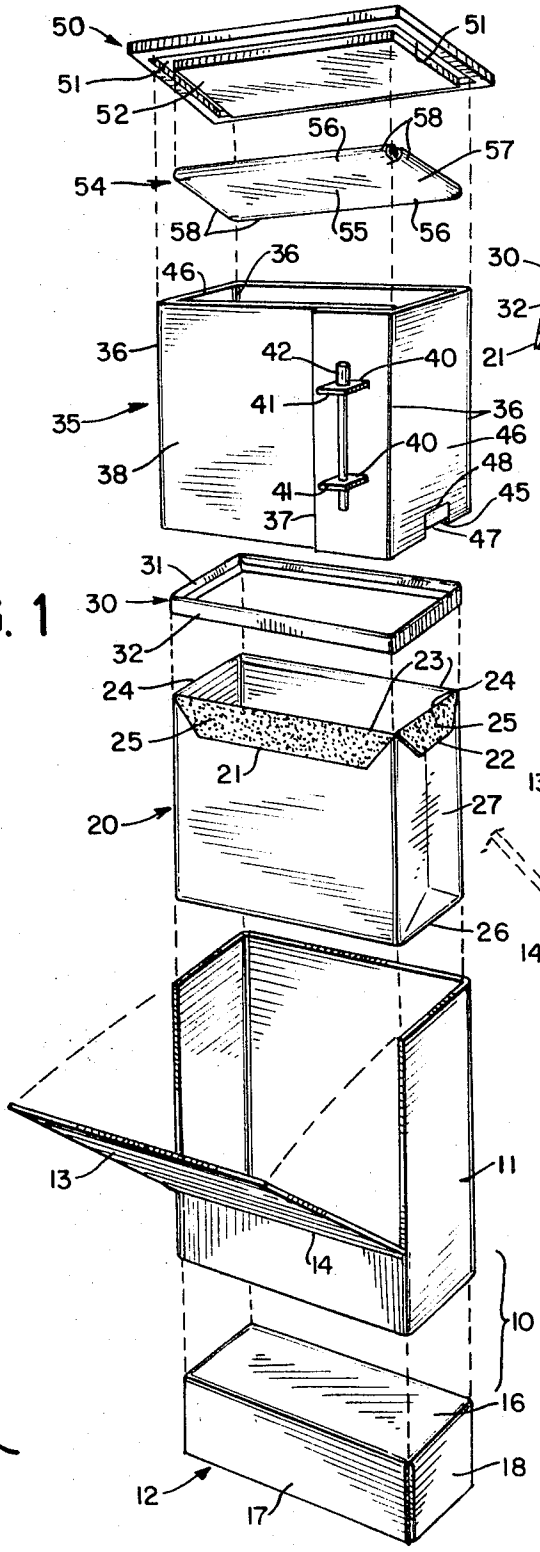
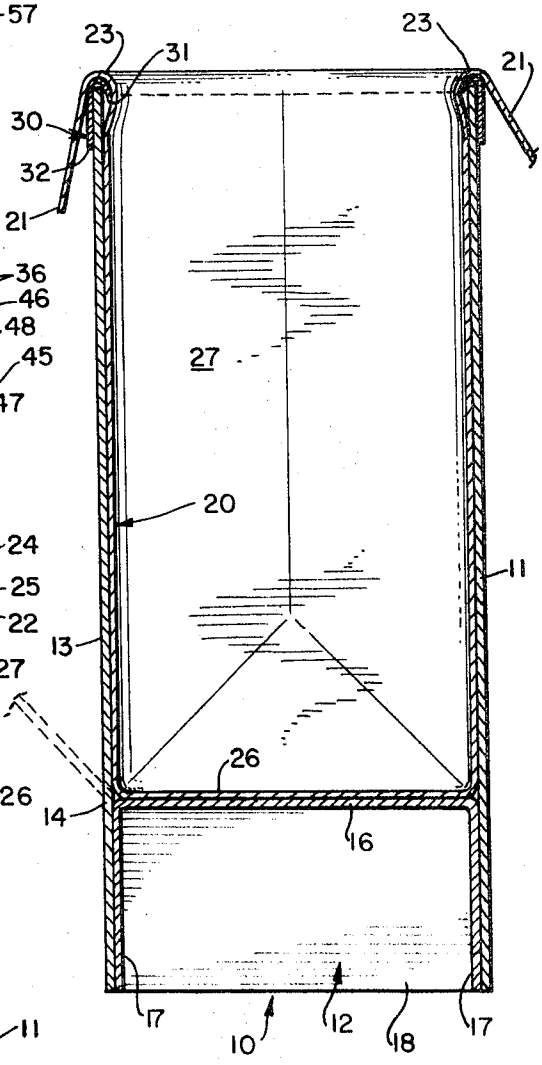


FIG. 2



INVENTOR
FRANK GORDON BLEE

BY Burgess, Ryan & Hicks
ATTORNEYS

FIG. 3

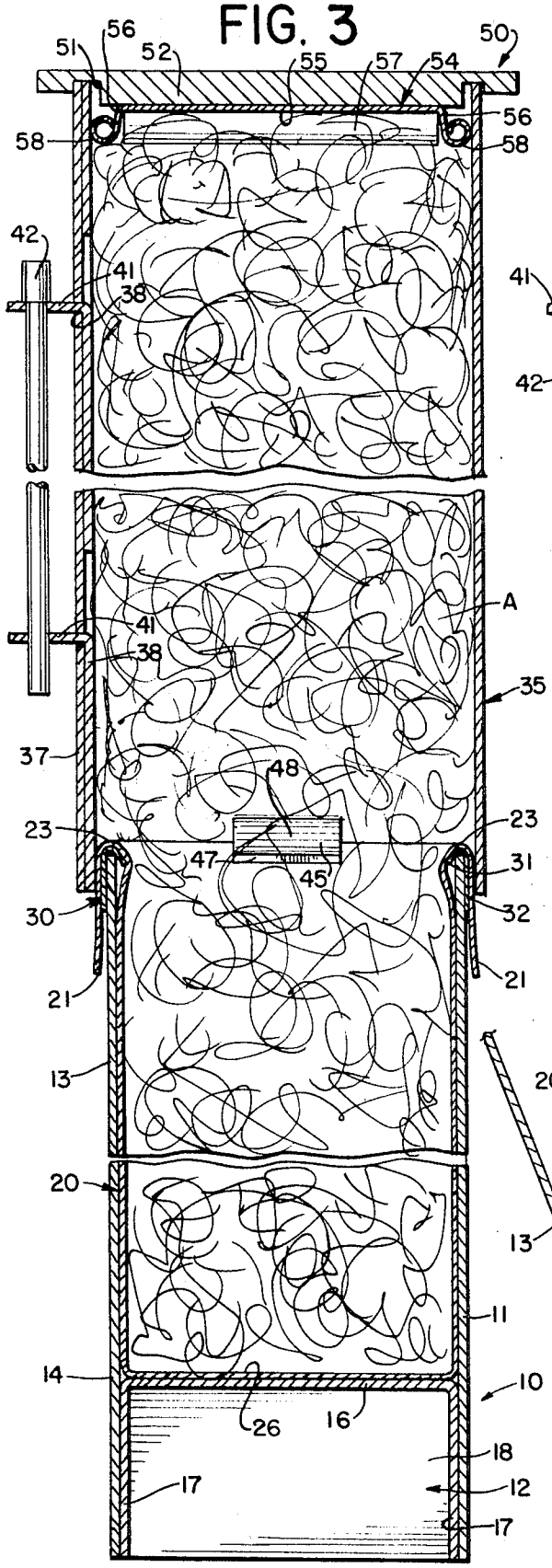


FIG. 4

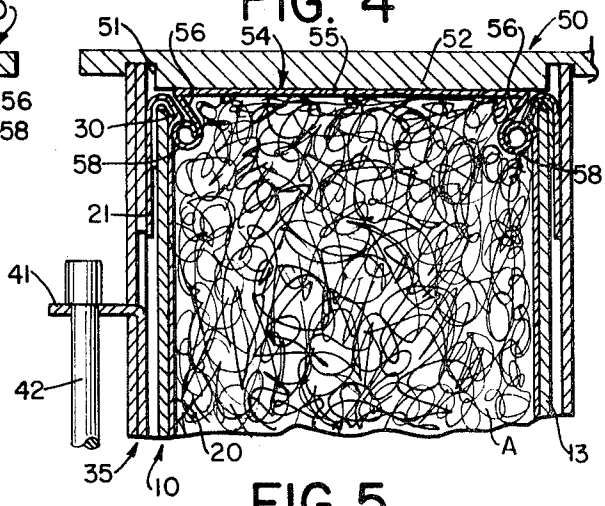


FIG. 5

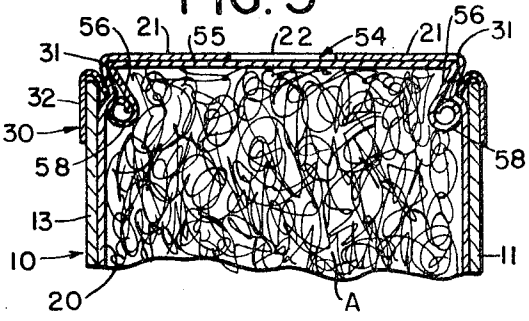
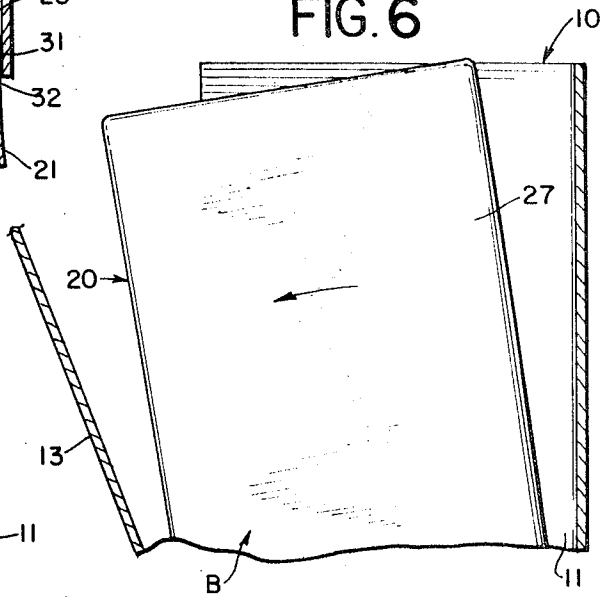


FIG. 6



INVENTOR
FRANK GORDON BLEE

BY Burgess, Ryan & Hicks
ATTORNEYS

FIG. 7

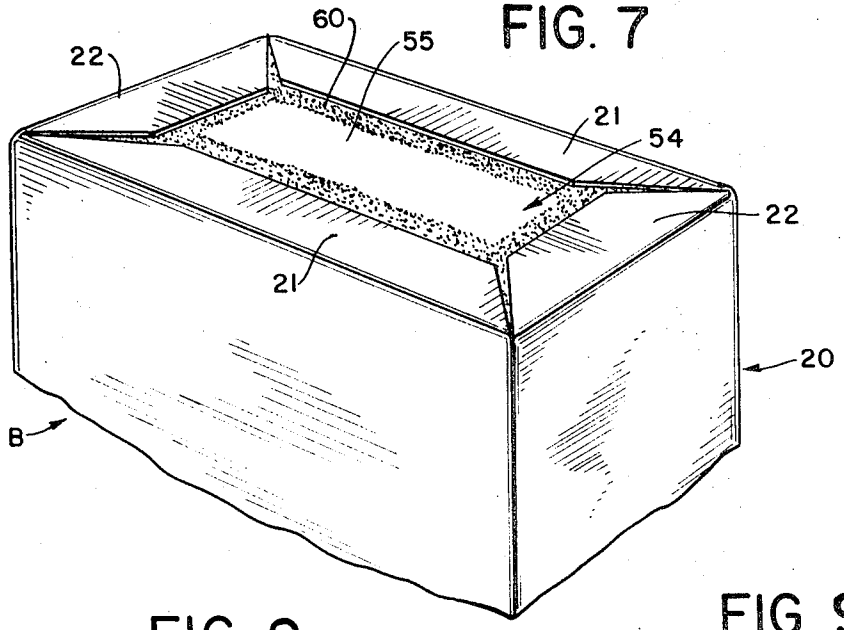


FIG. 8

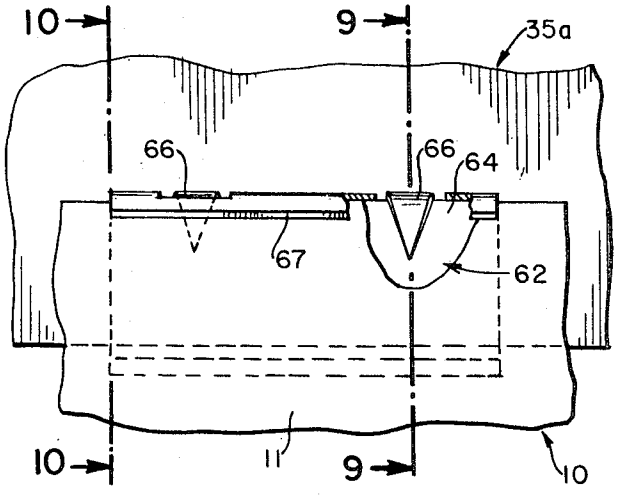


FIG. 9

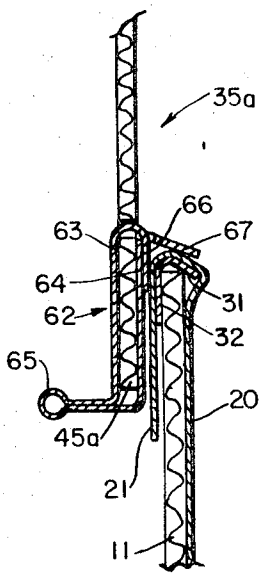
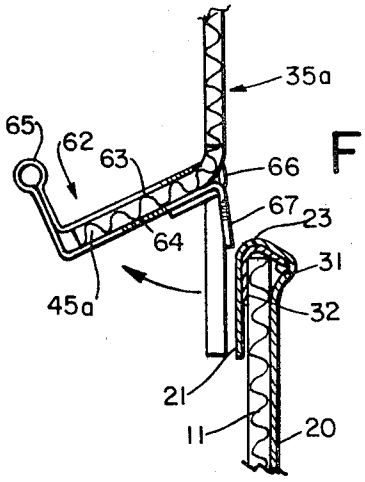


FIG. 10



INVENTOR
FRANK GORDON BLEE

BY Burgess, Dinklage & Sprung
ATTORNEYS

DEVICE FOR CONTAINING, COMPACTING AND BALING REFUSE

The present invention relates to a device for containing refuse, such as trash, garden leaves and papers, and for compacting and baling the contained refuse for storage or disposal.

One object of the present invention is to provide a device of the type referred to, which can be made of inexpensive materials, which can be knocked down into space economizing condition for storage when not in use and can be set up into operative condition quickly by simple manipulations, which when set up can be used as a waste basket or container, which when filled can be manipulated to compress the refuse into a compact mass and which is operable to bale or package neatly the compressed mass for storage, transportation or disposal.

In accordance with certain features of the present invention, the device is made up of a number of separate components, at least some of which are made of pensive materials, such as plain or corrugated cardboard. One of the components which may be set up from knocked-down condition is a box, and another component is a tubular slide, telescopically fitted over said box with a snug slide fit. The slide, when upwardly extended from the box, can be locked in this extended condition against downward movement to form an open top waste basket or receptacle for the refuse to be baled, and can be released to permit it to be lowered over the box and to thereby collapse the receptacle. A removable ram over the released slide, while the slide is collapsibly slid downwardly over the box, compresses the refuse collected in the waste container into a compact mass. A bag in the box into which the refuse is collected, can be removed from the box to form a neat compact package or bale suitable for easy disposal or storage.

Other objects, features and advantages of the present invention are apparent from the following description and from the accompanying drawings, in which:

FIG. 1 is an exploded view of the different components of the device of the present invention, shown in perspective;

FIG. 2 shows in vertical section the lower box of the device with the bag therein prior to complete assembly;

FIG. 3 is a vertical section of the completed assembly in fully extended position after the device is completely filled and the ram is placed in position on top of the tubular slide in preparation for the refuse compressing operation;

FIG. 4 is a vertical section of the upper part of the lower box and of the tubular slide after the refuse has been completely compressed therein, but while the compressing is still in position;

FIG. 5 is a vertical section of the upper part of the lower box after the refuse has been completely compressed therein, after the compressing cover is removed, and after the tubular slide has been removed from around the box;

FIG. 6 is a vertical section of the upper part of the lower box at a stage subsequent to that shown in FIG. 5, after the compressed refuse has been baled or packaged and is being removed from the lower box;

FIG. 7 shows in perspective the upper section of the baled or packaged refuse;

FIG. 8 an inside elevation of a section of the assembled box and tubular slide in extended condition and showing a modified form of contrivance for releasably locking the slide in extended condition onto the box;

FIG. 9 is a section of the assembly of FIG. 8, taken on lines 9–9 of FIG. 8 and showing the locking contrivance in locking position; and

FIG. 10 is a section of the assembly of FIG. 8, taken on lines 10–10 of FIG. 8 and showing the locking contrivance in released position to permit the tubular slide to be lowered over the box.

Referring to FIGS. 1 and 2 of the drawings, one of the main components of the device of the present invention is a rectangular box or container 10, made of inexpensive material, such as corrugated cardboard or boxboard normal shipping container strength. The box 10 comprises two separate pieces, namely a rectangular tube 11 defining the peripheral walls of the box and a rectangular insert 12 forming the bottom of the box. The tube 11 has a front wall 13 in the form of a panel bendable along a hinge or score line 14 spaced above the bottom of the tube to form a front door, which in open position, permits the compressed refuse to be taken out of the box. The box tube 11 can be collapsed into flattened condition by folding along diagonally opposite fold lines of the tube, so that the tube in collapsed knocked-down condition, occupies a minimum of storage space when not in use.

The insert 12 is made of a single sheet of board material similar to that from which the tube 11 is made. This sheet comprises a main rectangular panel 16 and flaps 17 and 18 around said panel bendable along crease or score lines to form the insert 12 in inverted traylike form, as shown in FIGS. 1 and 2.

The insert 12, folded as shown in FIG. 1 and described, is shaped and dimensioned to fit snugly with a friction retaining conforming fit into the bottom of the tube 11, and when inserted completely into the tube, the panel 16 serves as a bottom for the tube, and is at a level with the hinge line 14 of the door 13, as shown in FIG. 2 to serve as a platform across which the refuse bale may be slid for discharge from the box 10, as shown in FIGS. 2 and 6, when the door is open.

With the box 10 completely assembled as described, and its door 13 open, a bag 20 is inserted into the box 10. The bag 20 is made of flexible material, such as kraft paper, plastic, and the like and can be expanded from flattened condition into fully expanded condition shown in FIG. 1. When fully expanded, as shown in FIG. 1, the bag is rectangularly shaped and dimensioned to fit closely and conformably in the inside of the box, as shown in FIG. 2 and has side flaps 21 and end flaps 22 at the top foldable along lines 23 and 24 and coated on the inside with contact sealing material 25 such as rubber cement, serving the purpose to be described. When the bag 20 is fully fitted into the seated in the box 10 to line the box, as shown in FIG. 2, the flaps 21 and 22 of said bag will extend beyond the upper edges of the box.

The flexible bag 20 has an infoldable bottom wall 26 and infoldable sidewalls 27, so that these bags may be stacked and stored for future use in flattened condition. In this flattened state, the flaps 21 and 22 may be folded inside the bag.

The expanded bag 20 is inserted into the box 10 through the front doorway, while the door 13 is opened. The door 13 is then closed.

For locking the door 13 in closed position after the bag 20 has been inserted into the box 10, there is provided a frame 30, made of rigid material, such as metal or plastic and rectangularly channel-shaped and dimensioned to fit conformably over the upper edge of the box. The frame 30 has an inverted angular cross section with a narrow inside web 31 and a wider outside web 32. The frame 30 is straddled over the upper edge of the box 10 with the door 13 closed, so as to latch the door in closed position, and the bag flaps 21 and 22 are threaded through the frame and then folded over said frame and downwardly over the outside of the box, as shown in FIG. 2.

After the completion of the box—bag—frame assembly shown in FIG. 2 and described, a tubular slide 35 open at the top and bottom is seated on the top of the assembly to form a telescopic extension for the box 10. The slide 35 is made from a flat rectangular blank of the same material as the box 10, bendable along crease or score lines 36 to form a tube rectangularly shaped dimensioned to fit snugly and conformably over the upper part of the box 10 and over the bag flaps 21 and 22, with a slide fit, as shown in FIG. 3. The tubular slide 35 is constructed to permit it to be easily opened up to allow its removal from the box 10, after the slide has been lowered telescopically over the box, and the refuse has been compressed for baling. For that purpose, the blank from which the tubular slide 35 is made has a flap 37, overlapping a front end panel 38 of the blank, when the blank is folded into tubular

shape and provided with vertically superposed slots 40. The end panel 38 has two vertically superposed tabs 41, cut out from the panel and bent out of its plane for passage through the slots 40 respectively. A dowel 42 passes through holes in the tabs 41, and may have a head or friction fit with the upper tab to retain the dowel removably in position, as shown in FIG. 1.

The wraparound construction of the tubular slide 35 allows easy storage thereof in flattened condition, and permits it to be easily set up for mounting on the box 10 and easily opened up for removal from box after the refuse has been compressed for baling.

The tubular slide 35, when set up and mounted on the box 10 in elevated or extended position, is seatably locked thereto against downward movement by means, shown in the embodiment of FIGS. 1—6 comprising two tabs 45, cut from opposite sidewall panels 46 of the slide and foreshortened at their lower ends to provide gaps 47 for the insertion of a finger or a tool by which the tabs may be bent outwardly to release the slide for downward movement, without the necessity of completely disengaging the slide from the box, when the slide is lifted from the box 10 sufficiently to clear the tabs 45. For locking purposes, the tabs 45 are bent inwardly about score or crease lines 48, to project them into the tubular slide 35, and these tabs in conjunction with the lower sections of the sidewall panels 46 of the slide, straddle the upper edges of the box, as shown in FIG. 3. In this straddling position of the tubular slide 35, the tabs 45 seat on the upper edges of the box 10, and the slide forms an upper extension of the box. The box 10 and the slide 35 so extend, form an open top container or receptacle for such refuse as garden leaves, weeds, paper and the like.

When the receptacle 10, 35 has been completely filled to the top with refuse A, this refuse is ready to be compressed and baled. For compressing the refuse, there is provided a rigid rectangular ram plate 50, made of stiff strong cardboard, such as corrugated cardboard, and dimensioned to extend marginally outwardly beyond the upper edges of the slide 35 to form marginal hand grasp sections. The ram plate 50 is provided with a rectangular groove 51 its underside to receive the upper edges of the slide 35, and has a rectangular boss 52 on its lower face, shaped and dimensioned to extend into the slide with a small uniform marginal clearance, as shown in FIG. 3, and serving the purpose to be described. The groove 51 in the ram plate 50 serves to center properly the boss 52 in relation to the slide 35, as well as the box 10, during compression of the refuse.

After the slide 35 has been released from the box 10 by manipulation of the tabs 45 in a manner to be described, the ram plate 50 is pressed downwardly. This operation moves the slide 35 downwardly, thereby compressing the refuse A and transferring all of the refuse from the slide into the bag 20, until the ram plate 50 reaches the top of the box 10, as shown in FIG. 4.

To provide a lid for the top of the bag 20 for baling after the refuse A has been compressed and to maintain the bale shape and size, while the slide 35 and frame 30 are being removed from the box 10, there is provided a cover 54, made of a flat piece of cardboard, lighter than the board from which the box is made to permit cover to be flexed or made of heavy kraft paper. The cover 54 has a flat center panel 55 of rectangular shape to fit with slight peripheral clearance in the slide 35, and has four rectangular flaps 56 and 57 around the periphery of said panel, separated by rectangular corner cutouts and rolled at their ends to form sealing beads 58. The flaps 56 and 57 are separated from the center panel 55 by lines, which may constitute light crease lines, rigid enough, so that these flaps can be flexed with inherent spring action along these lines. With this construction, before the cover 54 is inserted in position in the slide 35, the flaps 56 and 57 can be bent downwardly to fit the cover inside the slide. The flaps 56 and 57, when released in the slide 35, will be urged angularly with inherent spring-action outwardly towards the plane of the center panel 55, and its beads will be spring-pressed against the inner walls of the slide 35.

In the operation of the device described, after the combined box 10 and the tubular slide 35 in position to form a fully extended receptacle, are filled with refuse A to the top of the slide, the cover 54 is inserted in the slide over the refuse in the manner described, and the ram plate 50 is placed on top of the slide with said slide extending into the groove 51, as shown in FIG. 3. The tubular slide 35 is then raised relative to the box 10 sufficiently to bring the lower edges of the two tabs 45 above the upper edges of the box and sufficiently to permit a finger to extend into the gaps 46 and to bend these tabs from an inwardly extending position to an outwardly extending positions to clear the upper edges of the box. With the tabs 45 in this released position, the tubular slide 35 can be moved telescopically downwardly over the box 10 by application of manual pressure on the ram plate 50.

As the manual downward pressure is applied to the ram plate 50, and the released tubular slide 35 is moved downwardly, the refuse A in the slide and the box 10 is compressed and the refuse in the slide at the same time is transferred to the bag 20 in the box. When the ram plate 50 reaches a position near the top of the box 10, the boss 52 on the underside of the ram plate serves to insert the cover 54 into the bag 20 and during this operation, the spring-pressed beads 58 riding on the bag flaps 21 and 22 overlying the edges of the box 10, are cammed inwardly until they pass below the lower edges of the bag covered frame web 31, whereupon the beads snap outwardly to lock with said frame web, as shown in FIG. 4. The cover 54 so latched to the frame 30, maintains the refuse in the bag 20 compressed and rectangularly shaped for baling or packaging, after the ram plate 50 is removed, as shown in FIG. 5.

After the tubular slide 35 has been pushed downwardly to its lowermost position, the ram plate 50 is removed, thereby exposing the top of the cover 54, as shown in FIG. 5. At this stage, the bag flaps 21 and 22 are folded inwardly over the top of the cover 54, as shown in FIG. 7. The top of the cover 50 has a coating 60 of contact sealing material, such as rubber cement, around a margin wide enough to accommodate the full widths of the flaps 21 and 22, when they are turned over against the top surface of the cover. Since the bag flaps 21 and 22 are coated on the inside with contact sealing material 25, when the coated sides of the flaps 21 and 22 and the coated top area of the cover are brought into contact, they will adhere firmly to each other to form a package or bale B, shown in FIG. 7. In this connection, it should be pointed out that a surface to which a coating of this contact sealing material is applied, will not adhere to a surface which is not so coated, but will adhere to a similarly coated surface. The ram plate 50 will, therefore, not adhere to the top of the cover 54, and can be separated therefrom, when such separation is required. Also, the property of the contact sealing material described, will permit the flaps 21 and 22 to be tucked into the inside of the body of the bag 20 for storage, when the bag is in collapsed flattened condition before use, without adhering to said bag body.

After the bale B has been formed and packaged, as described and shown in FIG. 7, it is necessary to remove the bale from the box 10. The compressed refuse in the bale B bears outwardly against the walls of the box 10, and these walls may bulge outwardly sufficiently to tighten the tubular slide 35 around it, so that it may be difficult to remove the slide from the box. However, in order to remove the tubular slide 35 from the box 10 with ease, all that is necessary is pull out the dowel 42 from the holes in the tabs 41 and unwrap the slide from the box 10.

When the tubular slide 35 has been removed from the box 10 in the manner described, the frame 30 is lifted from the box, and this releases the door 13, permitting it to be pulled outwardly about its hinge line 14 into open position. With the door 13 so opened, the bale B can be slid from the box 10 along the bottom panel 15 of the box through the doorway, as shown in FIG. 6.

FIGS. 8, 9 and 10 show another embodiment of the means for seatably locking the tubular slide, designated by the nu-

meral 35*a*, to the box 10 in extended position against downward movement. For that purpose, the slide 35*a* has two tabs 45*a*, corresponding to the tabs 45 in the construction of FIGS. 1—6 except that the tabs 45*a* are not foreshortened to form gaps for finger manipulation. These tabs 45*a* are hinged about respective crease or score lines 47*a*. A metal clip 62 is connected to each of the tabs 45*a*, bent from a sheet of metals to form two parallel panels 63 and 64, flanking the tab to define a leg. The intermediate section of the metal sheet is bent from the leg panels 63 and 64 to form a finger piece 65 in the shape of a foot on the outside of the tubular slide 35*a*. For securing the panels 63 and 64 to the tab 45*a*, the panel 63 has extending from its upper end, barbs 66, passing through the tab near its hinge 47*a* and through slots in the panel 64 bent against said panel 64. The panel 64 terminates at its upper end in a flange 67 inside the tubular slide 35*a*, inclined slightly downwardly in relation to the plane of the tab 4*a*, to form a stop for the slide.

When the tab 45*a* is in the plane of the panel of the tubular slide 35*a* from which the tab is cut, the stop flange 67 seats and catches onto the upper edges of the bag—and frame covered box 10, as shown in FIG. 9. The slide 35*a* thereby is locked against downward movement. By slightly raising the tubular slide 35*a*, grasping the finger piece 65 and pulling it angularly outwardly and upwardly until the stop flange 67 is outside and clears the bag—and frame-covered edges of the box 10, the slide is released for downward refuse compressing operation, as shown in FIG. 10.

What I claim is:

1. A device for compacting material, such as refuse, comprising a box, open at one end, a tubular slide open at both ends and telescoped over said box for sliding movement therealong, means for mounting said slide on the open end of said box in extended position to define with said box a receptacle for said material and releasable to permit said slide to be moved telescopically along said box in receptacle collapsing direction, and a plate adapted to be removably placed over the outer open end of said tubular slide in extended position to cover said slide and to be held in covering position, while the slide is being moved along said box in said direction, the material in said receptacle being compressed and the material in said slide being transferred to said box and merged with the material in said box, as the covered slide is moved telescopically along said box in said direction.

2. A device as described in claim 1, comprising a bag adapted to line said box and to receive the material deposited in said box, said bag being removable from the box with the compressed material therein.

3. A device as described in claim 2, said bag having flaps at one end around its periphery folded outwardly over the edges of the box at its open end while the receptacle is in extended condition and while said receptacle is being collapsed, said flaps being adapted to be folded inwardly over the top of the bag, after the material has been compressed and has all been contained in said bag.

4. A device as described in claim 3, comprising a cover adapted to be placed over the material in said bag after the material has been compressed and has all been contained in said bag, said bag flaps being adapted to be folded inwardly over said cover after the material has been compressed and has all been contained in said bag, and means securing said flaps in inwardly folded position to said cover to form a bale with the bag containing all of the compressed material.

5. A device as described in claim 4, said securing means comprising adhesive on the insides of said flaps and adhesive on the outside of said cover in areas where said flaps will be folded in contact therewith.

6. A device as described in claim 1, said box being substantially rectangular in shape, and said tubular slide being of corresponding cross section.

7. A device as described in claim 1, said box having a doorway on one side and a door for said doorway, closed during the material compressing stage and blocked by said tubular slide during said stage, said door being adapted to be opened when said tubular slide is moved from door blocking position, to permit the compressed material in said box to be discharged from said box and through the open doorway.

8. A device as described in claim 7, said door being hinged at its lower end and in closed position having its free end in the region of the open end of the box.

9. A device as described in claim 1, said box being substantially rectangular in shape and said tubular slide being of corresponding cross section, one of the sidewalls of said box being hinged at its lower end and having its other free end in the region of the open end of the box, said hinged wall constituting a door and defining a doorway on the side of said box, said door being closed during the material compressing stage and being blocked by said tubular slide during said stage, said box having a bottom wall surface substantially at the level of the door hinge, said door being adapted to be opened when said tubular slide is moved from door blocking position, to permit the compressed material in said box to be discharged from said box, along said bottom wall surface and out through the open doorway.

10. A device as described in claim 7, said door being hinged at its lower end and in closed position having its free end in the region of the open end of the box, said device comprising a frame of substantially rigid material corresponding substantially in shape to shape of the box at its upper end and defining an inverted channel by which said frame can be straddled over the upper edge of the box with the door closed to lock said door in closed position, said frame being removable to permit said door to open when said tubular slide is not in door blocking position.

11. A device as described in claim 1, said tubular slide comprising a single sheet of board bendable to bring the end sections of said sheet together in overlapping relation, said device comprising means for releasably securing said overlapping end sections together.

12. A device as described in claim 11, said releasable securing means comprising a tab cut from one of the end sections of said tubular slide, the other end section of the slide having a slot through which said tab extends when said board sheet is bent into tubular shape with said end sections overlapping, said tab having a hole, and a dowel passing through said hole when said board is so bent.

13. A device as described in claim 1, said slide mounting means comprising two tabs cut from opposite sidewalls respectively of the tubular slide at the lower end of said slide where said slide is mounted on said box, and bendable inwardly to cause said tabs and said sidewalls jointly to straddle the edges of the box at its open end to lock said slide against telescopic movement along said box in said direction, said tabs being bendable outwardly when said slide is lifted from the box sufficiently to release said tabs from straddling position from to permit the slide to be moved along said box in said direction.

14. A device as described in claim 13, wherein said tabs are foreshortened at their free ends in relation to the adjacent edges of said sidewalls to provide gaps for the insertion of a finger.

15. A device as described in claim 1, said slide mounting means comprising two tabs cut from opposite sidewalls respectively of the tubular slide at the end of said slide where said slide is mounted on said box, and bendable inwardly from the planes of said sidewalls, and a clip of rigid material secured to each of said tab for angular movement with said tab and having a foot at its free end extending outwardly of the slide to form a finger piece, and a flange at its other end near the bend line of the tab, extending inwardly of the slide to form a stop when seated on an edge of said box at its open end, said flange extending in a direction to serve as a stop when the tab is in the plane of the corresponding sidewall panel, and extending in a direction to clear said box edge when the tab is bent outwardly from the plane of the corresponding sidewall to release said slide for movement along said box in said direction.

16. A device as described in claim 1, said box being made of flat boards and comprising two units, one unit being in the form of a rectangular tube open at both ends and collapsible along bend lines into flattened condition for storage and transportation, the other unit constituting an insert for one end of said tube and comprising a main rectangular panel and four flaps around said panel bendable into transverse directions in relation to said panel to form an inverted traylike body dimensioned to fit snugly and conformably with a friction fit in one end of said tube, with said panel defining the bottom wall of said box.

17. A device as described in claim 9, said box being made of flat boards and comprising two units, one unit being in the form of a rectangular tube open at both ends and collapsible along bend lines into flattened condition for storage and transportation, the other unit constituting an insert for one end of said tube and comprising a main rectangular panel and four flaps around said panel bendable into transverse directions in relation to said main panel to form an inverted traylike body dimensioned to fit snugly and conformably with a friction fit in one end of said tube, with said main panel defining said bottom wall surface of said box.

18. A device as described in claim 16, said tubular slide comprising a single sheet of board bent into rectangular cross section corresponding to the cross section of the box for close slide movement along said box, and having its end sections brought together in overlapping relation, said device comprising means for releasably securing said overlapping end sections together.

19. A device as described in claim 1, comprising a bag adapted to line said box and to receive the material deposited in said box, said bag being removable from the box with the compressed material therein, said plate in operative position extending marginally beyond the periphery of the tubular tube and serving as a ram plate adapted to receive manual pressure by which the slide can be pushed telescopically along said box, said ram plate on its inside having a boss extending into said slide in operative position of said ram plate, said device including a cover adapted to be placed over the material in said slide in preparation for the compressing stage, and adapted to be pressed into the upper section of said bag by said boss, after the material has been compressed and has all been contained in said bag.

20. A device as described in claim 1, comprising a bag adapted to line said box and to receive the material deposited in said box, said bag being removable from the box with the compressed material therein, said device including a cover adapted to be placed over the material in said slide, and said plate being adapted to be placed over said cover in preparation for the compressing stage, said cover being of heavy paper having inherent resiliency and comprising a main rectangular panel and four flaps extending around the periphery of said panel, and rolled at their free ends to form sealing beads, said flaps being bent nonacutely away from the plane of said panel against the inherent resiliency of the cover when said cover is inserted in said slide, said cover being shaped and dimensioned to fit in said slide with said flaps folded and said beads pressing against the inside wall surfaces of the slide with sealing spring-action, said cover being adapted to be pressed into the upper section of said bag by said plate after the material has been compressed and has been all contained in said bag.