Dec. 27, 1932. F. D. COPPOCK 1,892,566

MOBILE SPREADER

Filed Dec. 10, 1931 2 Sheets-Sheet 1

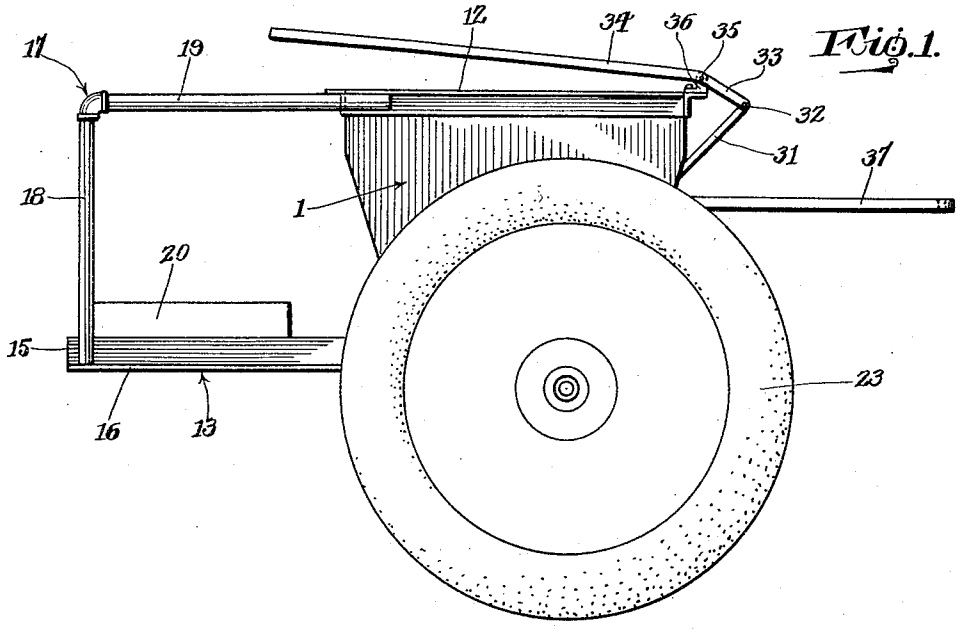


Fig. 1.

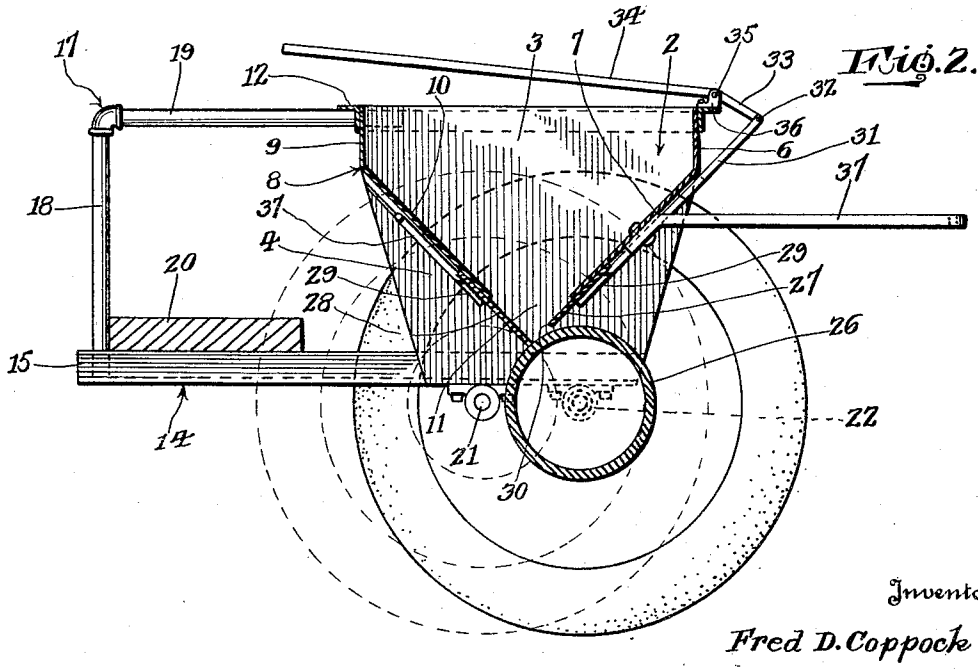


Fig. 2.

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MOBILE SPREADER

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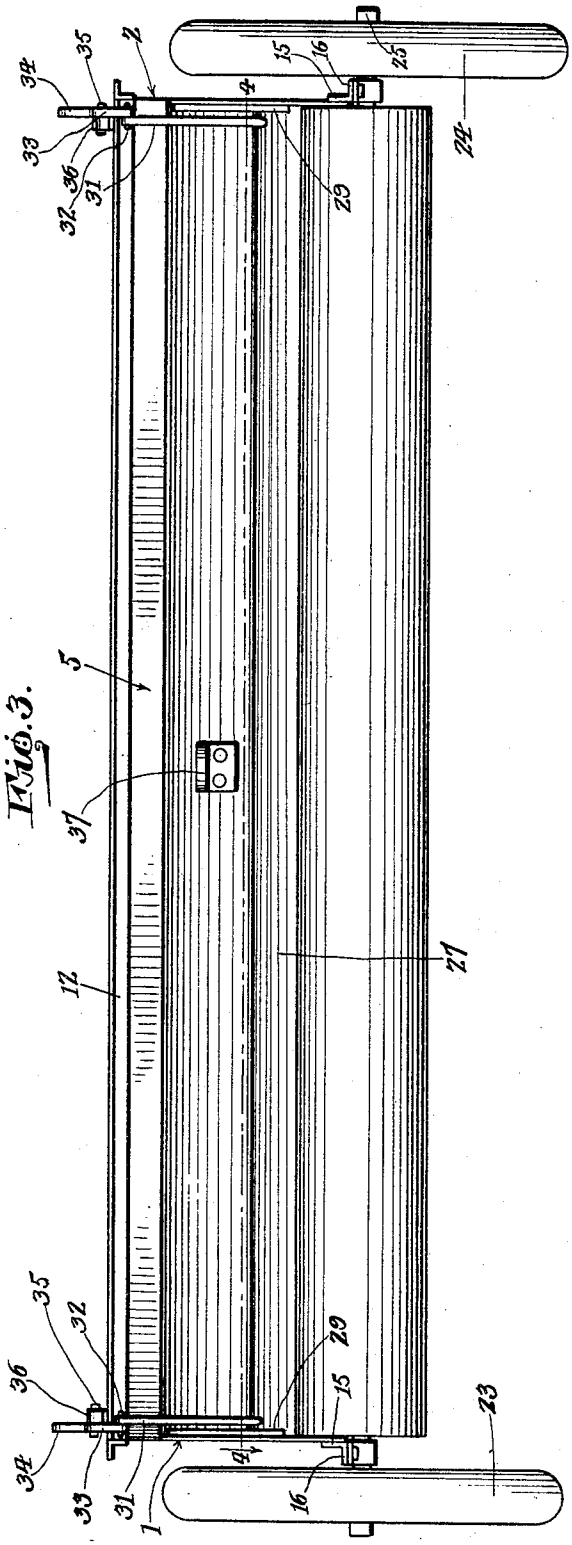


Fig. 3.

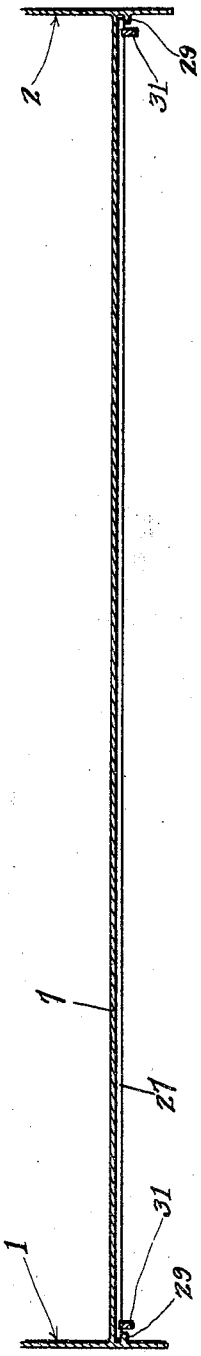


Fig. 4.

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UNITED STATES PATENT OFFICE

FRED D. COPPOCK, OF GREENVILLE, OHIO

MOBILE SPREADER

Application filed December 10, 1931. Serial No. 580,141.

My invention relates to a trailer hopper feed or spreader hereinafter termed a spreader designed primarily for the spreading of sand, stone, gravel, cinders, slag and other materials on highways, either for skid prevention, for surface treatment or in the construction of macadam and other types of road, but it is to be understood that a spreader, in accordance with my invention may be employed in any connection for which it is found applicable.

The essential objects of my invention are to provide a spreader capable when active to attain a regular and fine thickness of spread regardless of the speed of the vehicle by which it is drawn; enabling much finer or thinner spreads to be made than that obtained by a spreader employing a gravity type gate; providing for proportionately large sized material being spread to a thin average depth; permitting spreading of the material on backing; and to attain these ends in a strong, durable, compact, thoroughly efficient, conveniently adjusted, readily assembled and comparatively inexpensive structure.

The spreader is of the mobile type and includes a pair of traction wheels fixed to a rotatable axle, an adjustable spreading roll bodily carried by the latter and coacting with the outlet of the spreader body, and controllable selectable gates for and common to the outlet and coacting with the roll to provide for the discharge of the material on the travel of the spreader. The spreading roll is extended forwardly of the outlet for forward spreading and rearwardly of the outlet for backward spreading. The ratio of diameters between the wheels and the roll determines the thickness of the material spread. This is not merely theoretically true, it is also approximately true in practice, for instance if the ratio is 4:1 and the gate lip is $\frac{1}{2}''$ off the roller, i. e., the outlet being $\frac{1}{2}''$ open, then the spread is $\frac{1}{4}$ of this or $\frac{1}{8}''$.

In skid prevention the spreading must usually be done in conditions of heavy traffic, where the vehicle may be forced to speed up or slow down, or even stop. Under such conditions the thickness of spread automatically remains the same. It must be exceedingly thin. The sand may be as large in top size as $\frac{3}{16}''$, yet a spread this thick on the road would be unnecessary, costly and less efficient than a smaller amount. With a wheel-roll ratio of 4:1 we can have a gate opening that will allow $\frac{3}{16}''$ material to pass, yet the spread on the road has an average thickness of only 3/64".

For macadam and other similar roads thick layers of material are required and these can be efficiently handled by a wider open gate up to a certain thickness of spread,—and above that thickness by the use of a different wheel ratio.

In hilly country under rainy or icy conditions the truck with its load of sand can not gain sufficient wheel traction to climb the hills. It therefore becomes necessary to back up hill, thus spreading sand on the road in advance of the truck wheels. The spreader is readily adaptable to an operation of this sort. If the backing up distance is only a few hundred feet sufficiently satisfactory spreading can be done with backward gate. If however as in macadam road construction it becomes necessary for a long distance or long period of time to operate the trailer backing up, it is then provided that the roll can be removed from its forward position and reattached in its rearward position. In this position and using the backward gate, the spreader operates in the same manner and with the same degree of control as in the first position.

It is also necessary to use the backing-up method when surface treating tar roads, under which conditions it is practically impossible for the truck to obtain traction unless it is backing up.

To the above ends essentially and others which may hereinafter appear my invention consists of such parts and such combination of parts as fall within the scope of the invention as claimed.

In the drawings:

Figure 1 is a side elevation of a spreader in accordance with my invention.

Figure 2 is a horizontal sectional view thereof.

Figure 3 is a front elevation.

Figure 4 is a fragmentary sectional view on line 4—4 Figure 4.

The spreader includes a body part of hopper like form to carry the material and consisting of a pair of side walls 1, 2, each having a tapered part 3 and a rectangular part 4, the latter being of less height than the former and providing the upper portion of the side wall. Interposed between the walls 1, 2 as well as being secured thereto is a combined front wall and forward bottom section forming element 5, and the latter includes a perpendicular upper portion 6 forming the front wall and inwardly extending, depending, rearwardly inclined lower portion 7 of greater height than portion 6 and providing the front section of the bottom of the body part. The portion 7 has its lower edge arranged above the bottom of the side walls. Arranged between, as well as being secured to the walls 1, 2, is a combined back wall and rear bottom section forming element 8, and the latter includes a perpendicular upper portion 9 forming the front wall and an inwardly extending, depending forwardly inclined lower portion 10 of greater height than portion 9 and providing the rear section of the bottom of the body part. The portion 10 has its lower edge arranged above the bottom of the side walls. The lower edges of portions 7 and 10 are arranged in parallel spaced alignment, and the space between such edges forms an outlet 11 for said body part. The top of the body part is reinforced at its front, back and sides by angle bars 12.

Connected to the outer face of each side wall, at the bottom of the latter is a rearwardly extending angle bar formed of a vertical and an outwardly directed horizontal flange, the latter being extended from the bottom of the former. The angle bars are indicated at 13, 14 and are oppositely disposed with respect to each other. The vertical and horizontal flanges of each bar are indicated at 15, 16 respectively. The bars 13, 14 extend rearwardly the desired distance from the body part and provide supports for a pair of handle members 17, each consisting of a vertical part 18 secured at its lower end to the rear end of an angle bar and terminating at its upper end into a forwardly directed part 19 which is secured against the outer face of an angle bar 12 at the top of a side wall. The angle bars 13, 14 have mounted thereon and secured to the vertical flanges thereof a plank 20 providing a platform. The parts 18 of the handle members are secured to the horizontal flanges of the bars 13, 14.

Secured to the lower face of and depending from the horizontal flange of each bar 13, 14 is a pair of spaced bearing elements 21, 22. The former is positioned between the vertical median and back of the body part and the latter is arranged between the vertical median and front of the body part. The bearing elements 21, 22 on bar 13 align with those on bar 14. The outlet 11 is arranged at the vertical median of the body part and above the space formed between each pair of bearing elements.

The spreader includes a pair of supporting wheels 23, 24 which are fixed to an axle 25 bodily rotating with the wheels. When the spreader is discharging forwardly the axle 25 is journaled in the aligning bearing elements 22 and when discharging rearwardly or backwardly the axle 25 is journaled in the aligning bearing elements 21. The axle 25 is removably attached to that pair of bearing elements in which it is journaled.

Fixed to the axle 25 is a spreader roller 26 of materially less diameter than that of the wheels 23, 24. Preferably the ratio of diameters of the wheels and roll is 4:1, that is to say the diameter of each wheel being four times greater than that of the roll, and the latter is of a length to extend from the inner face of side wall 1 to the inner face of side wall 2. The roll 26 is positioned between the side walls and below and spaced from the sections of the bottom of the body part. On front discharge, roll 25 is arranged below bottom section 7 and has its axis arranged forwardly of outlet 11. On back or rear discharge, roll 26 is arranged below bottom section 10 and has its axis arranged rearwardly of outlet 11. On front or forward discharge the major portion of the circumference of the roll 26 is arranged forwardly of outlet 11. On back or rear discharge the major portion of the circumference of the roll is arranged rearwardly of outlet 11.

The discharge through outlet 11 is controlled by a front and a rear adjustable gate 27, 28 respectively, the former being slidably mounted against the outer face of bottom section 7 and the latter is slidably mounted against the outer face of bottom section 10. Combined gate guide and retainers 29 are secured to the inner faces of the side walls 1, 2 and opposes in spaced relation the bottom sections 7, 10. The gates are disposed at opposite inclinations, are adjustable towards and from each other, and extend towards the vertical median of the body part. The gates are adjustable to vary the discharge through outlet 11, and when in such position depend below the side walls of the outlet. On forward discharge gate 27 controls the discharge of the material and gate 28 provides a stop to prevent the material from passing rearwardly from the body part. On rear or back discharge gate 28 controls the discharge of the material and gate 27 provides a stop to prevent the material passing forwardly from the body part. On front or forward discharge the gate 28 seats on the periphery of roll 26 forwardly of the vertical median

of the body part and the bottom edge of gate 27 is spaced from the periphery of roll 26 in advance of the point of the latter upon which seats gate 28. The gate 27, when the spreader is discharging forwardly is adjusted to the desired extent to depend from the bottom section 7 to form in connection with roll 26 a material discharge passage 30. On back or rear discharge the gate 27 seats on the periphery of the roll 26 rearwardly of the vertical median of the body part and the bottom edge of gate 28 is spaced from the periphery of roll 26 rearwardly of the vertical median of the body part and the bottom edge of gate 28 is spaced from the periphery of roll 26 rearwardly of the point of the latter upon which seats gate 27. The gate 28, when the spreader is discharging rearwardly is adjusted to the desired extent to depend from the bottom section 10 to form in connection with roll 26 a material discharge passage.

The gates are adjusted from the rear of the body part and for such purpose the gate 27 has attached to each end an inclined pull bar 31 pivotally connected at its upper end as at 32 to the outer end of the angularly disposed forward portion 33 of a rearwardly extending lever arm 34, the latter being mounted to swing upon a pivot 35 extended laterally from a support 36 secured to a front angle bar 12. The arms 34 extend rearwardly beyond the rear wall 9, over the top of the body part and provide means for elevating and lowering gate 27. Attached to the gate 28 for the purpose of elevating and lowering it is an upstanding handle member 37.

Attached to the bottom section 7 is a forwardly directed tongue or hitching bar for connecting the latter to a traction means.

What I claim is:—

1. A spreader including a hopper like body part for carrying the material to be spread and having an outlet in its bottom, rotatable supporting means for said body part, said means including a spreader roll bodily rotating therewith, said roll arranged below and having the major portion of its circumference located adjacent said outlet, and adjustable means carried by said body part for extension below said outlet and coacting with said roll to provide a passage of selected area positioned adjacent the vertical median of said body part for discharging the material in the direction of travel of the spreader, said rotatable supporting means including a pair of wheels, the ratio of the diameters between the wheels and roll being such for determining the thickness of the material spread, said adjustable means including a pair of gates slidably connected to the front and rear of the bottom of said body part and for depending below said outlet, said supporting means including a rotatable axle carrying said wheels and roll, means for selectively positioning said axle forwardly and rearwardly of the vertical median of said body part, and means operated from the rear of the body part for adjusting said gates.

2. A spreader including a hopper like body part or carrying the material to be spread and having an outlet in its bottom, a mobile rotatable supporting means for said body part including a rotatable axle located adjacent one side of said outlet, a spreader roll encompassing, fixed to and bodily rotating with said axle, said roll being permanently arranged out of contact with the traction surface upon which said means travels, said roll being arranged below and having the major portion of its circumference located adjacent said side of said outlet, adjustable means carried by said body part for extension below said outlet and coacting with said roll to provide a passage of selected area positioned adjacent the vertical median of said body part for discharging the material in the direction of travel of the spreader and a stop to arrest discharge of the material in a direction opposite to that of the direction of travel of the spreader, and means for operaing said adjustable means from the rear of said body part.

3. A mobile spreader including a hopper like body part for carrying the material to be spread and having an outlet in its bottom, a rotatable supporting means for said body part and including a spreader roll rigidly secured thereto and bodily rotating therewith, said roll arranged below and having the major portion of its circumference extended laterally with respect to said outlet, adjustable elements carried by the front and rear of the body part for extension below said outthe bottom of one side of said outlet for discharge passage of selected area positioned at the bottom of one side of said outlet for discharging the material in the direction of travel of the spreader, a platform arranged adjacent said body part, a combined supporting and suspending structure for the platform secured to and extended from one side of said body part, and means arranged on that side of the body part from which said structure extends for operating said adjustable elements.

4. In a mobile spreader, a container for the material to be spread and having an outlet in its bottom rearwardly extending bars secured to the sides of the container, a platform supported by said bars, rails secured to said bars and to the container, a rotatable supporting structure for said container and including a spreader roll positioned below said outlet, said roll bodily rotating with said structure, bearings for said structure secured to said bars, adjustable elements secured at the front and rear of the container and coacting with said roll for controlling discharge of the material from the container, and means operated at the rear of the container and by

an occupant on the platform for adjusting said elements.

5. In a mobile spreader, a container for the material to be spread and having an outlet in its bottom, a rotatable supporting structure including a spreader roll positioned below said outlet, means for selectively positioning the axis of said roll forwardly and rearwardly of said outlet, and adjustable elements carried by the front and rear of the container and coacting with the roll at a point adjacent the axis thereof for controlling the discharge of the material from said outlet.

6. A mobile spreader comprising, a hopper like body part portion for carrying the material to be spread and having a centrally disposed outlet in its bottom, bars secured to the bottoms of the sides of the body part below said outlet, a rotatable axle arranged below said bars, a spreader roll fixed at its axis to and bodily rotating with said axle, said roll having its ends opposing the inner faces of the sides of said body part below said outlet, said roll being arranged below and having the major portion of its circumference located adjacent said outlet, adjustable means carried by said body part for extension below said outlet and coacting with said roll to provide a passage of selective area positioned adjacent the vertical median of said body part for discharging the material in the direction of travel of the spreader and for arresting discharge of material in a direction opposite to that of the direction of travel of the spreader, means for connecting the axle to said bars, a pair of traction wheels fixed to said axle, the ratio of diameters between the wheels and roll being such for determining the thickness of the material spread.

7. A mobile spreader comprising a hopper like body part portion for carrying the material to be spread and having a centrally disposed outlet in its bottom, bars secured to the bottoms of the sides of the body part, a rotatable axle, a spreader roll fixed at its axis to and bodily rotating with said axle, said roll arranged below and having the major portion of its circumference located adjacent said outlet, adjustable means carried by said body part for extension below said outlet and coacting with said roll to provide a passage of selective area positioned adjacent the vertical median of said body part for discharging the material in the direction of travel of the spreader and for arresting discharge of material in a direction opposite to that of the direction of travel of the spreader, means for connecting said axle to said bars, a pair of traction wheels fixed to said axle, the ratio of diameters between the wheels and roll being such for determining the thickness of the material spread, and means coacting with and secured to said bars for selectively positioning said axle forwardly and rearwardly of the vertical median of said body part for selectively controlling discharge forwardly and rearwardly from said body part.

8. A mobile spreader comprising, a hopper like body part portion for carrying the material to be spread and having a centrally disposed outlet in its bottom, bars secured to the bottoms of the sides of the body part below said outlet, a rotatable axle arranged below said bars, a spreader roll fixed at its axis to and bodily rotating with said axle, said roll having its ends opposing the inner faces of the sides of said body part below said outlet, said roll being arranged below and having the major portion of its circumference located adjacent said outlet, adjustable means carried by said body part for extension below said outlet and coacting with said roll to provide a passage of selective area positioned adjacent the vertical median of said body part for discharging the material in the direction of travel of the spreader and for arresting discharge of material in a direction opposite to that of the direction of travel of the spreader, means for connecting the axle to said bars, a pair of traction wheels fixed to said axle and permanently maintained by said wheels out of contact with the traction surface upon which the wheels travel, the ratio of diameters between the wheels and roll being such for determining the thickness of the material spread, a platform carried by said bars rearwardly of said body part, and means for controlling said adjustable means from said body part.

9. A mobile spreader comprising a hopper like body part portion for carrying the material to be spread and having a centrally disposed outlet in its bottom, bars secured to the bottoms of the sides of the body part, a rotatable axle, a spreader roll fixed at its axis to and bodily rotating with said axle, said roll arranged below and having the major portion of its circumference located adjacent said outlet, adjustable means carried by said body part for extension below said outlet and coacting with said roll to provide a passage of selective area positioned adjacent the vertical median of said body part for discharging the material in the direction of travel of the spreader and for arresting discharge of material in a direction opposite to that of the direction of travel of the spreader, means for connecting said axle to said bars, a pair of traction wheels fixed to said axle, the ratio of diameters between the wheels and roll being such for determining the thickness of the material spread, means coacting with and secured to said bars for selectively positioning said axle forwardly and rearwardly of the vertical median of said body part for selectively controlling discharge forwardly and rearwardly from said body part, a platform carried by said bars rearwardly of said body part, and means for

controlling said adjustable means from said body part.

10. A mobile spreader comprising a container for the material to be spread formed with an outlet in its bottom, a rotatable supporting structure for said container including a spreader roll positioned below said outlet and a rotatable axle fixed to the axis of said roll and arranged adjacent said outlet, means for selectively connecting said axle to spaced points of said container to selectively position the axis of the roll forwardly and rearwardly of the outlet, and adjustable elements carried by the front and rear of the container and coacting with the roll adjacent the axis of the latter for controlling the discharge of the material from the container.

11. A mobile spreader comprising a container for the material to be spread formed with an outlet in its bottom, a rotatable supporting structure for said container including a spreader roll positioned below said outlet and a rotatable axle fixed to the axis of said roll and arranged adjacent said outlet, means for selectively connecting said axle to spaced points of said container to selectively position the axis of the roll forwardly and rearwardly of the outlet, adjustable elements carried by the front and rear of the container and coacting with the roll adjacent the axis of the latter for controlling the discharge of the material from the container, and means operated from the rear of the container for adjusting said elements.

In testimony whereof, I affix my signature hereto.

FRED D. COPPOCK.