Sept. 4, 1956 W. R. SHIELDS 2,761,588

MEASURING DISPENSER FOR EXPLOSIVE INGREDIENTS

Filed May 18, 1954 2 Sheets-Sheet 1

Fig. 1

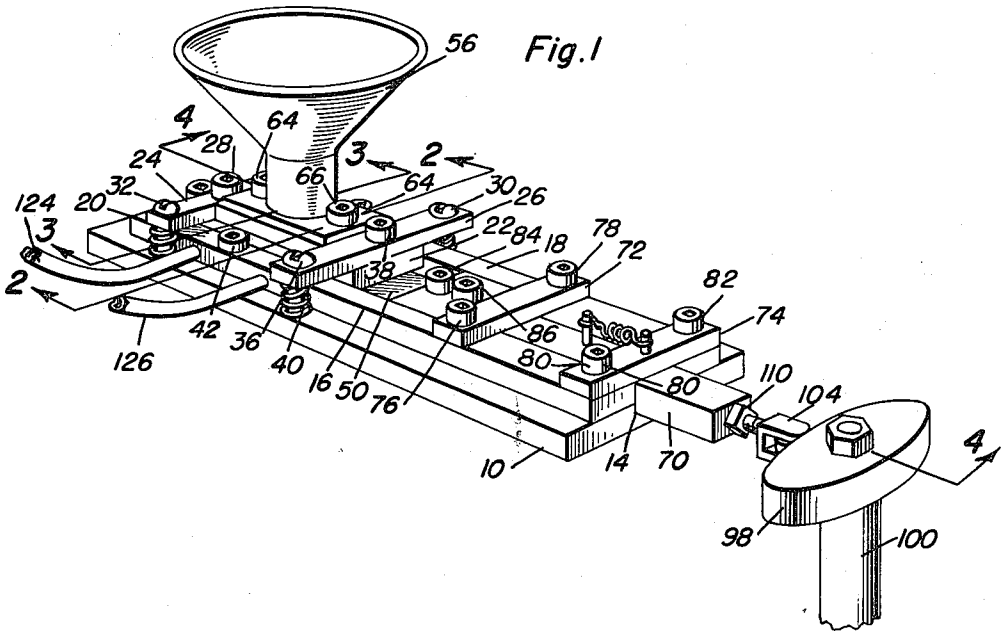


Fig. 2

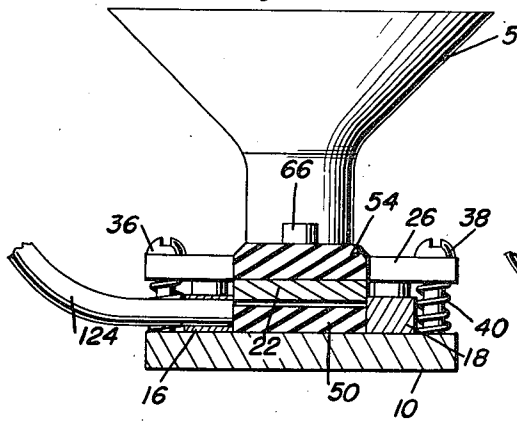
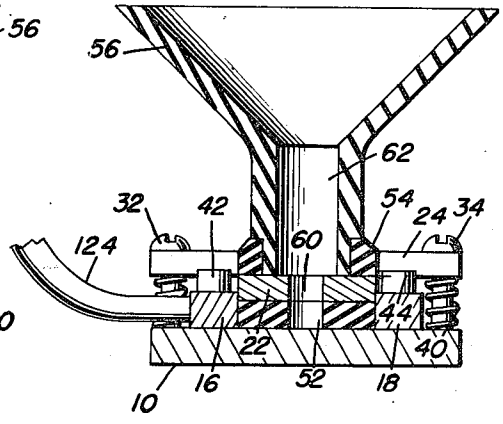


Fig. 3



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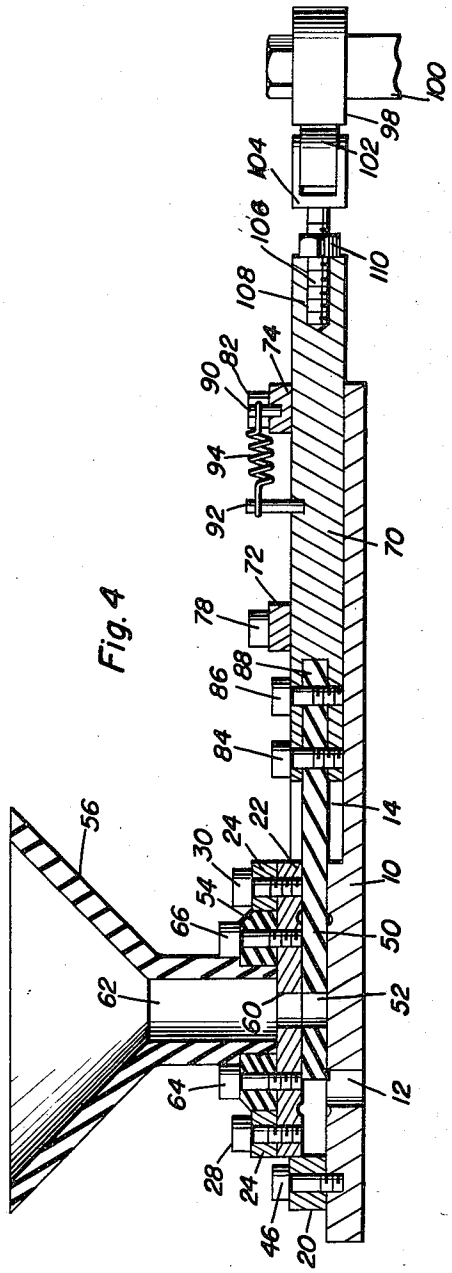


Fig. 4

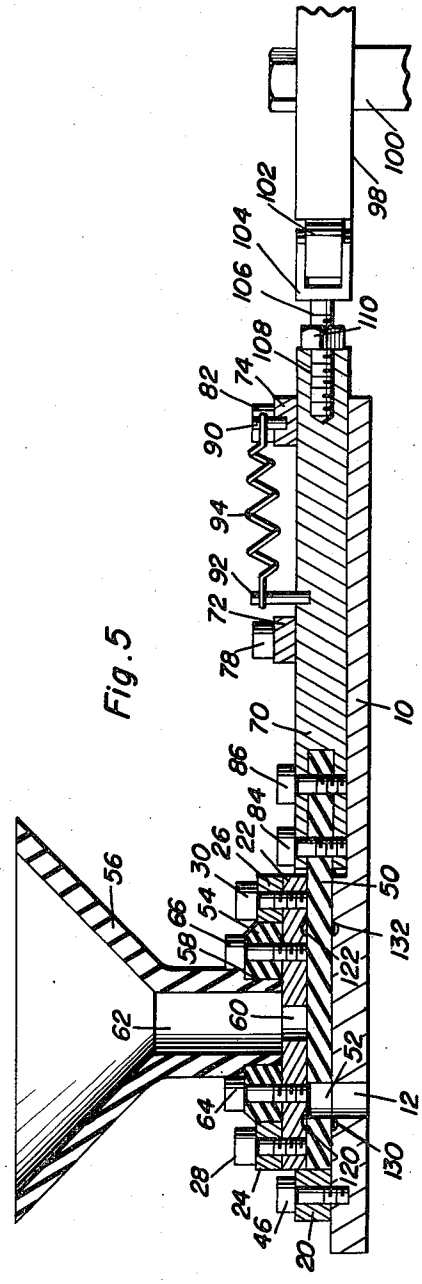


Fig. 5

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MEASURING DISPENSER FOR EXPLOSIVE INGREDIENTS

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Application May 18, 1954, Serial No. 430,554

6 Claims. (Cl. 222—148)

This invention relates to a measuring dispenser and particularly to a dispensing device to load highly sensitive powder in the suitable receptacles.

In the operation of charging highly explosive mixtures such as priming mixtures in the suitable containers such as the priming caps for cartridges, a great many "blows" or explosions result because of the striking of a spark from a portion of the machine, or because of the accumulation of the powder in some portion thereof and a consequent application of pressure thereto to cause a breaking of the grains.

The present invention relates to a charging device utilizing soft or non-spark producing metal such as copper or aluminum and having side portions constructed of such material as conducting rubber so that there will be no electrical sparks or sparks struck from any hard metal and in order to prevent accumulation of portions of the explosive, suction devices are provided for drawing the loose portions of explosive mixture from the top of the dispensing slide so that there can be no accumulation thereof.

It is accordingly an object of my invention to provide an improved explosive dispenser.

It is a further object of the invention to provide an explosive dispenser having its parts constructed of non-spark producing and high heat conducting material.

It is a further object of the invention to provide a measuring dispenser having means for cleaning the residue material therefrom.

Other objects and many of the attendant advantages of the present invention will be apparent from the following detailed description taken in conjunction with the accompanying drawings in which:

Figure 1 is a perspective view of the measuring dispenser according to the invention;

Figure 2 is a cross section through the device taken substantially on the plane indicated by the section line 2—2 of Figure 1;

Figure 3 is a cross section across the device taken substantially on the plane indicated by the section line 3—3 of Figure 1;

Figure 4 is a longitudinal sectional elevation taken substantially on the plane indicated by the section line 4—4 of Figure 1; and

Figure 5 is a view similar to Figure 4, but showing the measuring slide moved to discharge position.

In a measuring dispenser according to the invention, a base plate 10 is constructed of copper, aluminum, or other suitable soft non-sparking material having a high thermal conductivity. A discharge aperture 12 is provided in the base plate 10 and a suitable guide track 14 is provided adjacent one end of the base plate 10.

A guide frame consists of parallel side guide members 16 and 18 and an end guide member 20. A top plate 22 is mounted in the space between the guide rails 16 and 18 by means of suitable transverse mounting straps 24 and 26, the plate 22 being connected to the cross mounting straps 24 by means of a setscrew 28 and to the cross

strap 26 by means of a setscrew 30. The ends of the straps 24 and 26 are mounted on the base plate 10 by means of the screws 32 and 34 applied through the strap 24 and screws 36 and 38 applied through the strap 26 and extending into suitable threaded apertures in the base plate 10 and having springs 40 thereon for lifting the straps 24 and 26 away from the base plate 10.

The side guide bar 16 is secured to the plate 10 by means of a cap screw 42, guide bar 18 is secured to the base 10 by means of the cap screw 44. Likewise the end bar 20 is secured to the base 10 by means of a cap screw 46.

A dispensing slide 50 is mounted in the space between the guide bars 16 and 18 and fills the space between the base 10 and the top plate 22 with the plate being relatively snug therein so that there is little if any place for explosive grains to be caught on top of the slide. The slide 50 is constructed of suitably electrically conducting rubber so that there will be no sparks between the rubber and the metal adjacent thereto. The slide is provided with a measuring aperture 52 and it will be apparent that the thickness of the slide 50 may be changed to provide different capacities for the measuring aperture 52.

An upper mounting block 54 constructed of suitable material such as rubber is mounted on the plate 22 and a hopper 56 will be received in a suitable aperture 58 of the mounting block 54. The top 22 being provided with a feeding aperture 60 thus communicates with the output bore 62 of the hopper 56, the mounting block 54 being secured to the top plate 22 by means of cap screws 64 and 66.

A driving pitman 70 is mounted in the guide channel 14 of the base plate 10 and is retained therein by means of cross straps 72 and 74 mounted on the extending ends of the guide bars 16 and 18, the retaining bar 72 being secured to the guide bar 16 by the cap screw 76 and to the guide bar 18 by the cap screw 78. Likewise, the strap 74 is secured to the side rail 16 by means of a cap screw 80 and to the side rail 18 by the cap screw 82. The driving bar 70 is connected to the measuring slide 50 by means of a pair of cap screws 84 and 86. Preferably the end of the bar 70 is bifurcated as at 88 to receive the slide member 50 with the screws 84 and 86 extending substantially through the slide bar 70.

An anchoring pin 90 is placed in the guide bar 74 and a similar pin 92 is mounted in the push bar 70 and a spring 94 is mounted between the pins 90 and 92 thus urging the bar 70 to withdraw the slide 50 until the apertures 52 and 60 are in alignment so that the device will normally stand in charging position. In order to move the slide 50 into discharging position so that the aperture 52 will be in register with the discharge aperture 12, a cam device 98 mounted on a drive shaft 100 and driven by a suitable device (not shown) is engaged by means of a cam follower roller 102 mounted in a bifurcated bracket 104 having a threaded stem 106 in threaded engagement with an aperture 108 of the push rod 70 and a lock nut 110 is provided on the shank 106 so that the follower 102 may be adjusted at will with respect to the push bar 70 and locked therein by means of the nut 110.

In order to prevent the accumulation of explosive grains on the surface of the slide 50, the top plate 22 is provided with transverse recesses 120 and 122 which extend transversely of the plate 22 and are arranged substantially just outside the limit of movement of the aperture 52 so that any material which is received on the top of the slide 50 will come in communication with the recesses 120 and 122 and suitable connections such as the conduits 124 and 126 are provided in communication with the recesses 120 and 122, respectively, with the conduits being connected to any suitable suction pump

(not shown) so that the suction will create a flow of air through the recesses **120** ad **122** and carry away any grains of the explosive mixture which might be entraped on the top of the slide **50**.

Preferably similar recesses **130** and **132** will be provided in the bottom plate **10** and will also communicate with the conduits **124** and **126** so that there will be no danger of accumulated grains below the slide **50**.

In the operation of the device according to the invention, the slide **50** will be selected which provides the exact charge desired and the plate **22** adjusted to snug engagement therewith and a small quantity of the explosive mixture will be placed in the hopper **56** and the cam **98** will be rotated to cause successive feeding of charges through the discharge aperture **12** where it will be received by any suitable mechanism (not shown).

For the purpose of exemplification a particular embodiment of the invention has been shown and described according to the best present understanding thereof. However, it will be apparent to those skilled in the art that various changes and modifications in the construction and arrangements of the parts thereof may be readily resorted to without departing from the true spirit and scope of the invention.

What is claimed as new is as follows:

1. A measuring dispenser for highly sensitive explosive powder comprising a base plate, a guide frame on said base, a top plate mounted for adjustment into said guide frame, said base frame and top plate being constituted of non-spark producing metal, a slide of conducting rubber reciprocally mounted between said base and said top, a non-metallic hopper mounted on said top plate, said top plate having a feed aperture therein communicating with said hopper with the top of said slide, said slide having a measuring aperture therein, said base having a discharge aperture therein, said feed and discharge apertures being out of alignment, means operable to actuate said slide to move said measuring aperture from said feed aperture to said discharge aperture, said top plate and base having passages therethrough communicating with the opposite faces of said slide throughout the width of the slide, and means operatively connected with said passages for removing powder accumulations from said slide during reciprocation thereof.

2. A measuring dispenser for handling sensitive explosive mixtures comprising a base plate having a discharge aperture therein, a guide frame rigidly mounted on said base plate, a top plate mounted for adjustment in said guide frame toward and away from said base plate, adjusting means mounting said top plate on said base plate, said top plate having feeding apertures therein, said feeding and discharge apertures being out of alignment, a slide reciprocably mounted between said base and said top plate, said slide having a measuring aperture therein and being reciprocable between positions of registry of said measuring aperture with said feeding and discharge apertures, said top plate and base having transverse grooves opening onto the opposite faces of said slide, suction means communicating with said grooves for cleaning the slide faces as the slide is reciprocated.

3. A measuring dispenser for handing sensitive explosive mixtures comprising a base plate having a discharge aperture therein, a guide frame rigidly mounted on said base plate, a top plate mounted for adjustment in said guide frame toward and away from said base plate, adjusting means mounting said top plate on said base plate, said top plate having feeding apertures therein, said feed and discharge apertures being out of alignment, a slide reciprocably mounted between said base and said top plate, said slide having a measuring aperture therein and being reciprocable between positions of registry of said measuring aperture with said feeding and discharge apertures, said slide being constructed of conducting rubber, said base plate, guide frame and top plate being constructed of non-spark producing metal, said top plate and base having transverse grooves opening onto the opposite faces of said slide, suction means communicating with said grooves for cleaning the side faces as the slide is reciprocated.

4. A measuring dispenser for handling sensitive explosive mixtures comprising a base plate having a discharge aperture therein, a guide frame rigidly mounted on said base plate, a top plate mounted for adjustment in said guide frame toward and away from said base plate, adjusting means mounting said top plate on said base plate, said top plate having feeding apertures therein, said feed and discharge apertures being out of alignment, a slide reciprocably mounted between said base and said top plate, said slide having a measuring aperture therein and being reciprocable between positions of registry of said measuring aperture with said feeding and discharge apertures, said slide being constructed of conducting rubber, said base plate, guide frame and top plate being constructed of non-spark producing metal, said top plate having transverse grooves therein opening onto the top face of said slide in closely spaced relation to said apertures and a suction connection to said transverse grooves.

5. A measuring dispenser for handling sensitive explosive mixtures comprising a base plate having a discharge aperture therein, a guide frame rigidly mounted on said base plate, a top plate mounted for adjustment in said guide frame toward and away from said base plate, adjusting means mounting said top plate on said base plate, said top plate having feeding apertures therein, said feed and discharge apertures being out of alignment, a slide reciprocably mounted between said base and said top plate, said slide having a measuring aperture therein and being reciprocable between positions of registry of said measuring aperture with said feeding and discharge apertures, said slide being constructed of conducting rubber, said base plate, guide frame and top plate being constructed of non-spark producing metal, said slide being reciprocable to move said measuring aperture successively into register with said feeding and discharge apertures, said top plate having transverse recesses adjacent the limit of movement of said measuring aperture opening onto the top face of the slide, a suction conduit connected to each of said recesses.

6. A measuring dispenser for handling sensitive explosive mixtures comprising a base plate having a discharge aperture therein, a guide frame rigidly mounted on said base plate, a top plate mounted for adjustment in said guide frame toward and away from said base plate, adjusting means mounting said top plate on said base plate, said top plate having feeding apertures therein, said feed and discharge apertures being out of alignment, a slide reciprocably mounted between said base and said top plate, said slide having a measuring aperture therein, said slide being constructed of conducting rubber, said base plate, guide frame and top plate being constructed of non-spark producing metal, said slide being reciprocably movable between positions of registry of said measuring aperture with said feeding aperture and said discharge aperture, said top and base plate having transverse grooves arranged in closely spaced relation to the limit of movement of said slide opening onto the opposite face of said slide, suction means communicating with said grooves.

References Cited in the file of this patent

UNITED STATES PATENTS

1,409,009	Julien	Mar. 7, 1922
1,528,022	Keiser	Mar. 3, 1925
2,131,548	Barrner	Sept. 27, 1938
2,405,507	Lefren	Aug. 6, 1946
2,654,285	McGirr	Oct. 6, 1953