

May 5, 1964

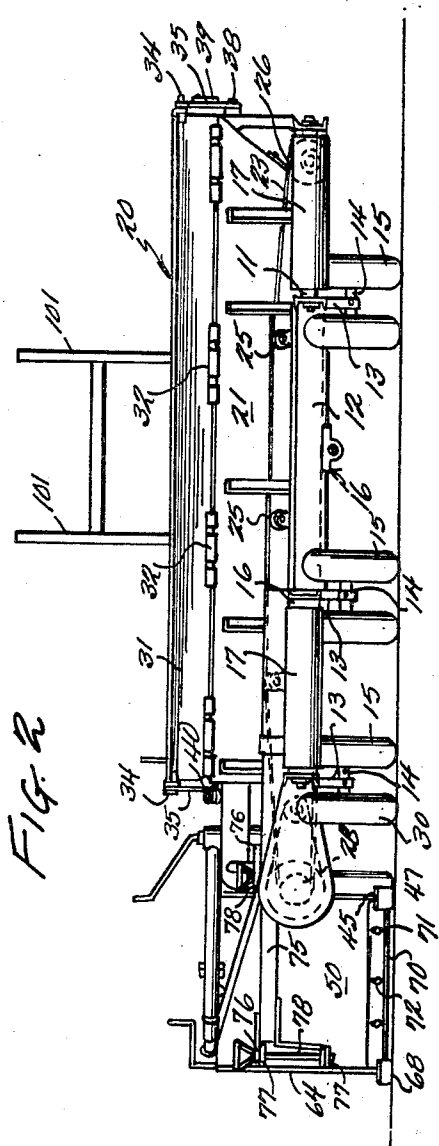
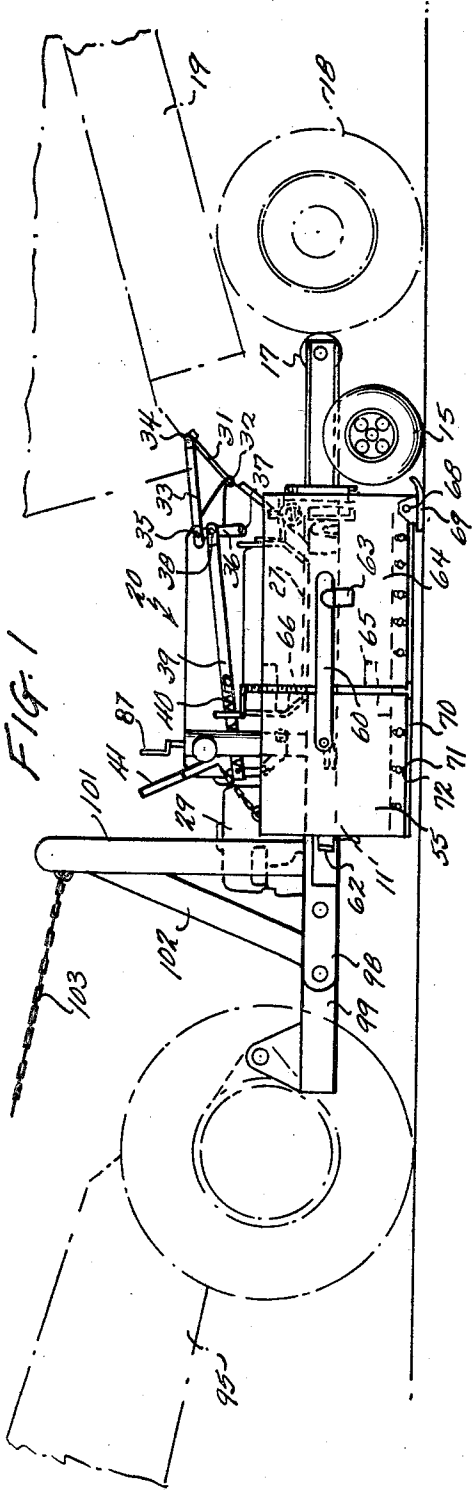
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3,131,616

SHOULDERING MACHINE

Filed July 20, 1961

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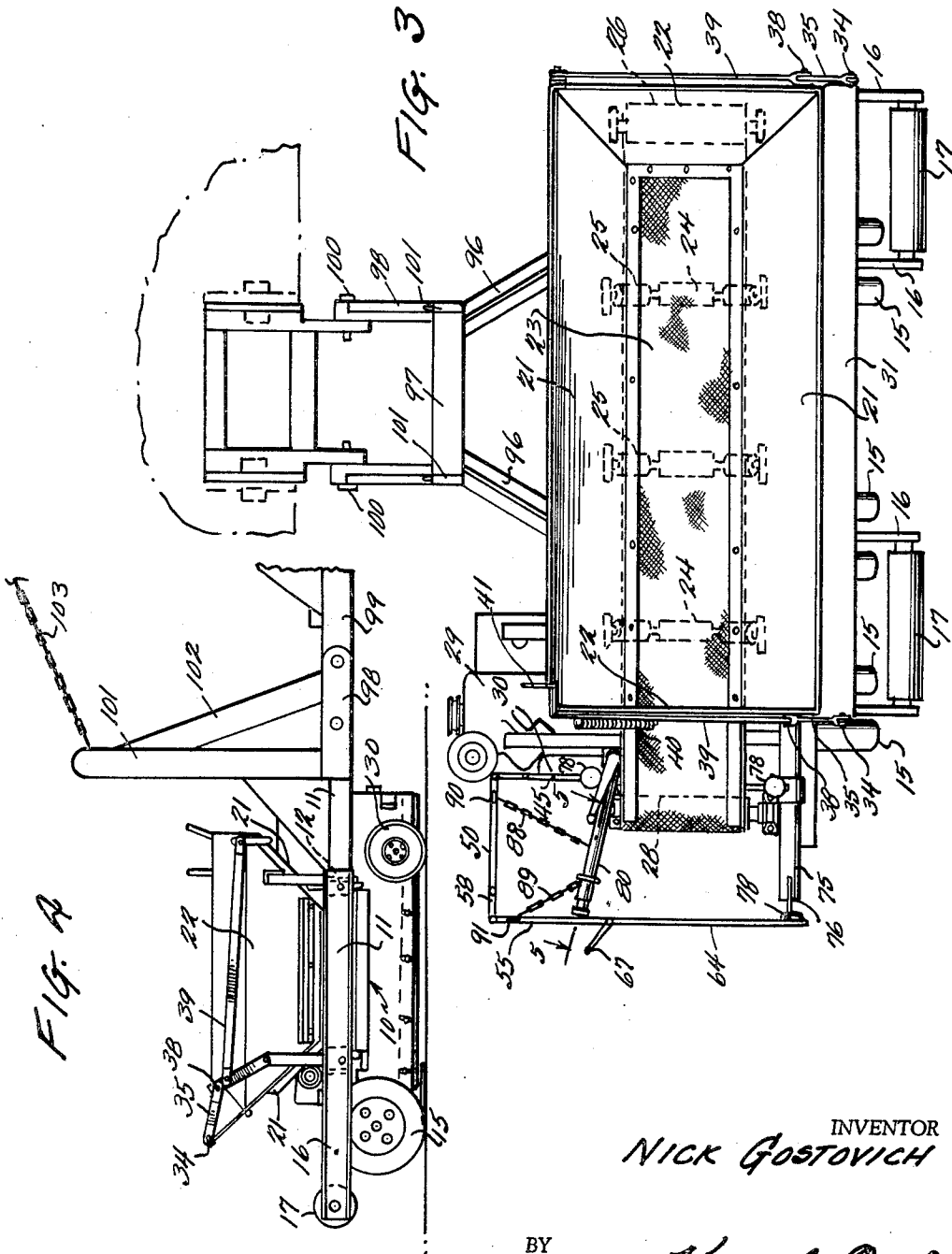


FIG. 1

FIG. 3

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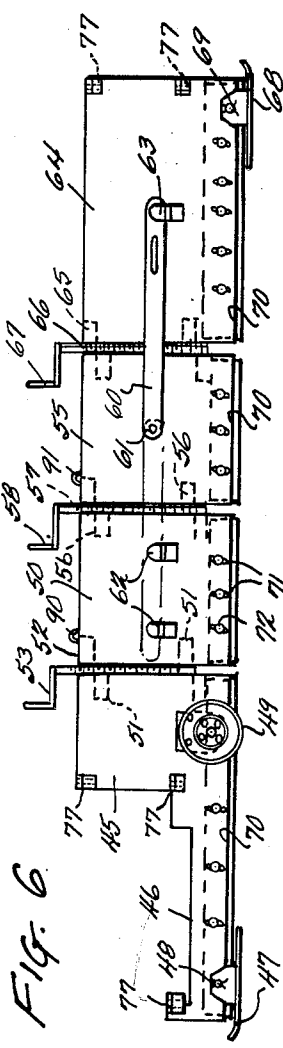


FIG. 6

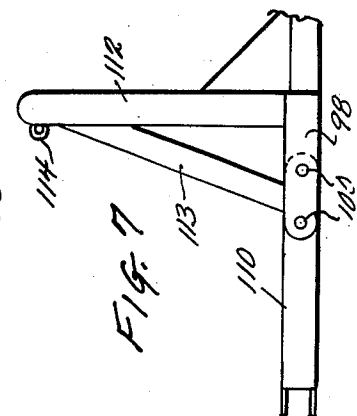


FIG. 7

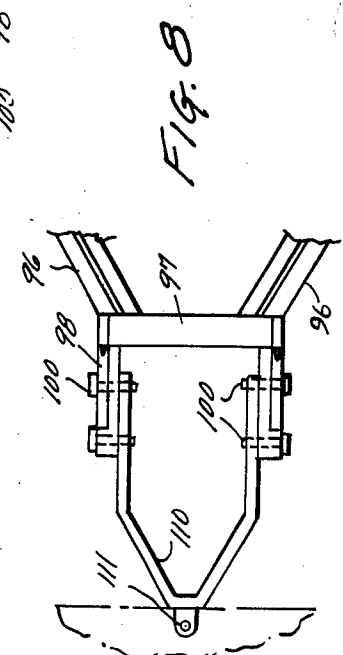


FIG. 8

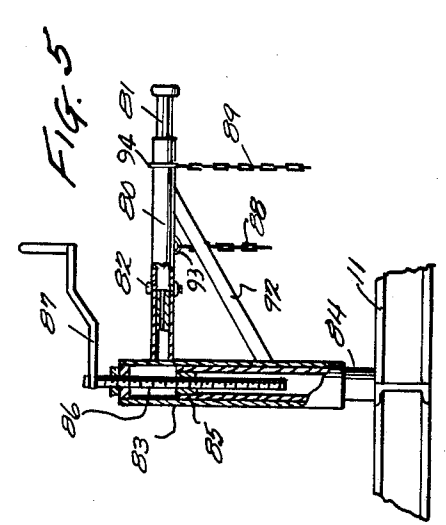


FIG. 5

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SHOULDERING MACHINE

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Filed July 20, 1961, Ser. No. 125,437

1 Claim. (Cl. 94-46)

This invention relates to a shouldering machine, and has as its primary object the provision of a shouldering machine for forming the shoulders of a road particularly characterized by the feature of being mounted on the front end of a motor grader or a four-wheel drive truck or similar vehicle, thus making the machine highly portable and maneuverable.

An additional object of the invention is the provision of a machine of this character provided with a hopper for the shoulder material, and a conveyor belt for conveying the material into a bin adjustable as to width which places the shoulder material on the shoulder to the desired width.

Still another object of the invention is the provision of a machine of this character which may be modified to provide either a two or four foot shoulder, or other desired selected widths.

An additional object of the invention is the provision of a machine which may be provided with a self contained power unit, or which can be powered by the unit upon which it is mounted.

An additional object of the invention is the provision of a flexible bin for placing the material on the shoulder, which by a simple hitch arrangement can be changed into width.

A further object of the invention is the provision of a machine of this character which is flexible, maneuverable, adjustable, sturdy and durable in construction, reliable and efficient in operation, and relatively inexpensive to manufacture, and utilize.

Still are objects reside in the combinations of elements, arrangements of parts, and features of construction, all as will be more fully pointed out hereinafter and disclosed in the accompanying drawings wherein there is shown a preferred embodiment of this inventive concept.

In the drawings:

FIGURE 1 is a side elevational view of one form of shouldering machine embodying features of the instant invention, set to its narrow, or two-foot width.

FIGURE 2 is a front elevational view of the device of FIG. 1.

FIGURE 3 is a top plan view of the machine.

FIGURE 4 is a side elevational view similar to FIG. 1, but taken from the opposite side of the device.

FIGURE 5 is a fragmentary enlarged view of the bin lowering and raising hoist, partially in section and partially in elevation, taken substantially along the line 5-5 of FIG. 3.

FIGURE 6 is a developed view of the shouldering bin, showing it in aligned or unfolded position, and showing the means whereby it can be adjusted to wide or narrow width.

FIGURE 7 is a side elevational view of a modified form of hitch; and

FIGURE 8 is a top plan view of the structure of FIG. 7.

Similar reference characters refer to similar parts throughout the several views of the drawing.

Having reference now to the drawings in detail, the machine of the instant invention comprises a frame generally indicated at 10 which consists basically of front and rear frame members 12 and end side frame members 11. The front member 12 has dependently secured thereto a plurality of supports 13, which carry double ended axles 14, each axle carrying a pair of rubber tired wheels 15 at its opposite ends. In the illustrative embodiment

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herein shown there are six of these wheels, although more or less may be utilized as desired.

Extending forwardly from front frame member 12 there are two pairs of longitudinally extending supports 16, between each pair of which is positioned a roller 17. The rollers 17 are adapted, when the machine is in use, to engage the rear wheels 18 (FIG. 1) of a conventional dump truck, the body of which is indicated at 19, in order to push the same forwardly in advance of the machine, for a purpose and in a manner to be more fully described hereinafter.

Frame 10 supports a rectangular hopper preferably rectangular in cross-section, generally indicated at 20, which includes inclined front and rear walls 21, and inclined side walls 22. The bottom of the hopper is open, and positioned thereunder there is an endless conveyor belt 23, which is mounted on approximately horizontally positioned rollers 24, each roller being supported between a pair of oppositely inclined end bearings 25, which are suitably mounted in the lower front and rear walls of the hopper. A terminal roller 26 is provided at the outer side of the hopper, beneath the outer inclined side wall 22, and the other end of the conveyor belt extends as at 27 through a suitable outer side opening in the end wall 22 of the hopper for a purpose to be more fully described hereinafter.

At its outer end 27 the conveyor belt 23 extends about a drive roller 28, which is powered in any suitable manner from a motor 29, which may be either gas or electric and which is suitably positioned on the frame members 11 and 12. The particular drive means for the conveyor belt comprises no essential part of the instant invention, and, if desired, power may be provided from a pushing vehicle, which will also be more fully described hereinafter.

A rear supporting wheel 30 mounts the rear end of the hopper 20 and frame 10 adjacent the motor 29.

The forward lip 31 of the front wall 21 of the hopper 20 is hinged as at 32, and may be raised or lowered as desired. The raising and lowering is effected by means of a link 33 on each side of the hopper, which is pivoted as at 34 to the top of the lip 31 and at 35 at its other end to an arm 36 which is in turn pivoted at 37 to the adjacent side wall 22 of the hopper. The arm 36 is in turn pivoted as at 38 to an operating link 39, which is spring biased by means of a spring 40 into a retracted position. An operating handle 41 controls the movement of the link 39 for varying the angular inclination of the lip 31.

By varying the angular inclination of the lip 31, the hopper 20 may be accommodated to various inclinations of the truck body 19 to control the flow of shoulder material into the hopper.

The shouldering device comprised by the adjustable bin of the instant invention is best disclosed in FIG. 6, wherein it is shown in inoperative position, and includes an inner side wall 45 which is provided with a cutaway portion 46 to accommodate the end of the conveyor belt 23. A skid 47 is pivotally mounted to the forward end of side wall 45, as by means of a pivot 48. A rear supporting wheel 49 is also carried by the rear end of the side wall 45.

A rear wall portion 50 is swingably secured, as by means of hinges 51, to the rear end of end wall 45, and the relative height of the two devices may be varied by means of a threaded rod which extends through the hinge barrels as indicated at 52. A crank 53 on the threaded rod 52 is rotatable to adjust the relative height of the two walls. An intermediate wall section 55 is swingably secured as by means of hinges 56, and a threaded rod 57 provided with a crank handle 58, to the opposite end of rear wall portion 50. The intermediate wall section 55 may serve either as a rear wall extension or an outer side

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wall extension in accordance with whether the device is used to provide a narrow or wide shoulder. This arrangement is effected by means of an elongated bar 60 which is pivotally mounted as at 61 in the center of intermediate wall section 55. A pair of brackets 62—62 are mounted on rear wall section 50, and when it is desired to use the intermediate wall section 55 as part of the rear wall, the bar is swung to the dotted line position of FIG. 6 and engages in the brackets 62—62 so that the wall sections 50 and 55 together form the rear wall of the bin. However, when a narrow shoulder is desired, the device is swung to the full line position and the bar 60 is received in a bracket 63, which is mounted on an outer side wall section 64. In FIG. 1 the wall sections are shown in the latter position. The outer side wall section 64 is swingably connected by means of hinges 65—65 to the opposite side of the intermediate wall section 55. The hinges 65—65 have a threaded rod 66, with a crank handle 67 thereon, extending through the loops of same for varying the relative height of the intermediate wall section 55 and the outer wall section 64, this threaded rod being similar to the threaded rods 52 and 57. A front skid 68 is pivoted as at 69 to the forward portion of outer side wall section 64 and serves to support the same. It is here pointed out that the forward end of the bin 20 is open. Runners 70 are provided on the bottoms of each of the wall sections 45, 50, 55, and 64, and are adjustable by means of elongated vertical slots 71 in the wall sections and bolts 72 extending through same for varying the initial heights of the bottom of each section above the road.

The bin 20 is removably mounted on the frame 10 by a three point support. The inner wall section 45 has thereon a pair of lugs 77—77 at the inner side of the full height part and a single lug 77 at its outer end, the latter being horizontally aligned with the lowermost lug of the pair. The lugs 77—77 of the pair have vertically aligned holes therein and the single lug 77 at the outer end of the section has a vertically positioned hole therein. Plates 76 are mounted horizontally on the frame 10 and have suitable holes therethrough. Pins 78, having enlarged heads, are received in the aligned holes in the lugs 77 and the plates 76. A similar but single point attachment is provided for the outer wall section 64. At the forward end of the latter there is a pair of vertically aligned lugs 77—77 having similar holes therethrough. A bar 75 extends outwardly of and transversely of the frame 10. On the other end of this bar there is a horizontally positioned plate 76 having a suitable hole therein. A bracket 75 is mounted on the bottom of the bar 75 and has a horizontally positioned lower flange 79a, also with a suitable hole therethrough. One of the pins 78 is also received in the aligned holes in the lugs 77—77 on the outer section 64, the plate 76, and the horizontal flange 79a of the bracket.

A hoist is provided for raising and lowering the bin 20. A hollow post 84 is mounted vertically on the outer frame member 11. In the top of the hollow post 84 there is secured a nut 85. Around the post 84 there is slidably mounted a closed sleeve 83, in the top of which there is a suitable screw threaded hole. A threaded rod 86 is received in the screw threaded hole in the top of the sleeve 83 and in the nut 85, and carries a crank handle 87 at its top. Adjacent the top of the sleeve 83 and at right angles to the latter, there is suitably mounted a hollow arm 80. A corner brace 92 is provided between the sleeve 83 and the arm 80. This arm 80 is provided with an extension 81 which is slidably received within same. The extension 81 is held in place by a bolt 82, which is diametrically positioned through same and received at its opposite ends in elongated longitudinally extending slots in the arm 80. A chain 88 is secured at its upper end within a loop 93 on the arm 80, and at its lower end to an eye 90 at the bottom of the rear wall section 50. Similarly, a chain 89 is received at its upper end in a ring 94, which surrounds the arm 80, and at its lower end in an eye 91 at the bottom

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of the intermediate wall section 55 is swung through 90° from the position shown in FIG. 3 to form an extension of the back wall 50, the extension 81 may be slid outwardly of the arm 80, and the ring 94 may be moved toward the outer end of the extension so as to place the chain 88 in more nearly vertical position.

When the shouldering device is arranged in the selected position with the intermediate wall section 55 comprising a part either of the outer side wall 64, or the rear wall 50, in accordance with the width of the shoulder to be formed, the machine is adapted to be attached to the front end of a suitable propelling vehicle which is generally indicated at 95 and which may comprise a tractor or the like. For this purpose inwardly converging frame members 96—96 extend forwardly from the main frame 10 to a transverse member 97, from which parallel extensions 98—98 extend to and are secured to the front frame of the tractor, or the like, by means of locking pins 100—100. Uprights 101—101 with diagonally positioned reinforcing bars 102 are secured to the extensions 98—98 and a guiding chain 103 is attached to the tops of the uprights 101—101.

An alternative hitch may be provided as shown in FIGS. 7 and 8. In this construction the frame members 96—96 and the transverse member 97 have suitably secured thereto, as by means of pins 100—100 a V-shaped channel bar 110, which is adapted to be attached by a pin 111 to a suitable towing vehicle, when it is desired to tow rather than push the machine. Similar uprights 112—112 and diagonally positioned reinforcing members 113—113 are provided, together with an eye 114 for the reception of the chain 103.

From the foregoing the use and operation of the machine should now be readily understood. The machine is first attached to a suitable propelling vehicle, and a truck containing shouldering material is positioned in front of the roller 17. As the machine is pushed progressively forwardly at a gradual rate of speed, shouldering material falls onto the conveyor belt 23 and then is conducted to the bin 20, formed by the inner and outer side walls 45 and 64, the rear end wall 50 and the intermediate wall section 55 which, in accordance with either its transverse or longitudinal position, forms either a wide or a narrow shoulder. The height of the shoulder is determined by the position of the bin 20 above the surface of the road, and the skirt 70, and a smooth and even shoulder is thus formed with a minimum of effort and without difficulty, since the shouldering is a machine operation involving no manual steps.

From the foregoing it will now be seen that there is herein provided an improved shouldering machine which accomplishes all the objects of this invention, and others, including many advantages of great practical utility and commercial importance.

As many embodiments may be made of this inventive concept, and as many modifications may be made in the embodiment hereinbefore shown and described, it is to be understood that all matter herein is to be interpreted merely as illustrative, and not in a limiting sense.

I claim:

A road shouldering machine comprised by a rectangular frame, wheels mounting the frame for movement over the road, a shouldering device comprised by a vertical inner side plate positioned parallel to one side of the frame and secured to the latter, a vertical rear end plate positioned at right angles to the vertical inner side plate, pivotal mounting means securing the vertical rear end plate at one end to the vertical inner side plate, a vertical intermediate plate positioned parallel to the vertical inner side plate and at right angles to the vertical rear end plate, pivotal mounting means securing the vertical intermediate plate at one end to the other end of the vertical rear end plate, a first bar pivotally mounted on the vertical intermediate plate, a vertical outer side plate positioned parallel to the vertical inner side plate, pivotal mounting

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means securing the vertical outer side plate to the other end of the vertical intermediate plate, a bracket on said vertical outer plate for receiving the first bar and holding the vertical intermediate and outer side plates in alignment, a second bar secured to the said side of the frame and extending outwardly transversely of the latter, and a detachable connection between the other end of the vertical outer side plate and the outer end of the said second bar.

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