Aug. 16, 1960 A. H. LOWRY 2,949,158

FIRE EXTINGUISHING MACHINE

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Fig. 2

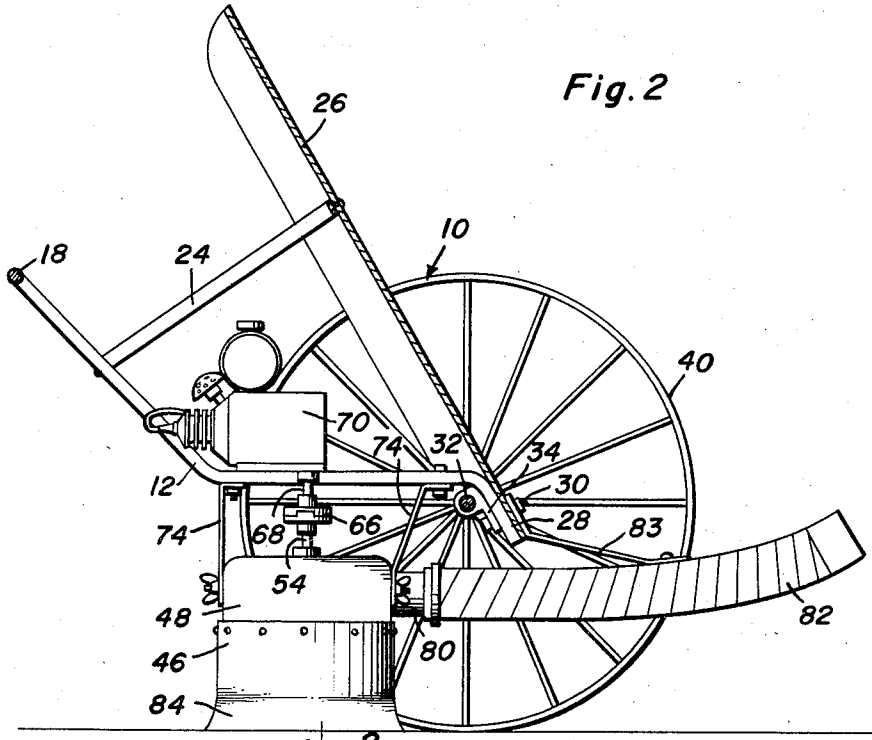
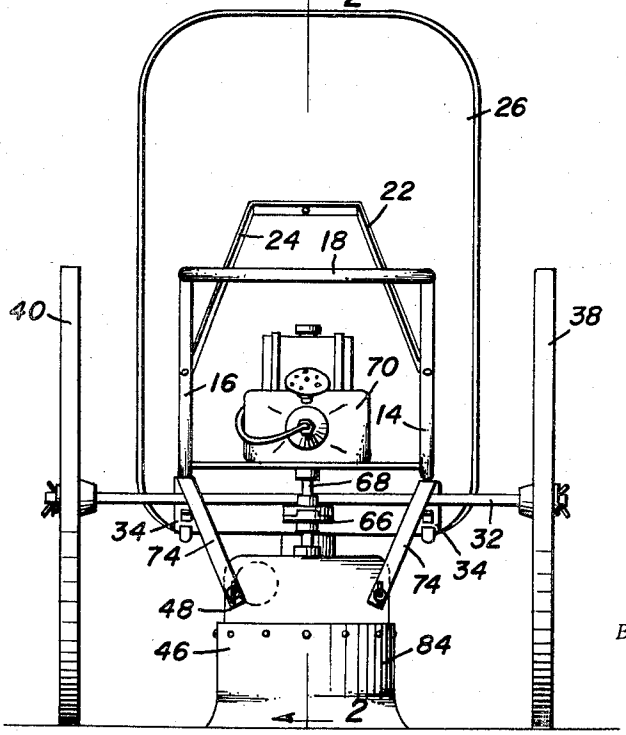


Fig. 1



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Fig. 3

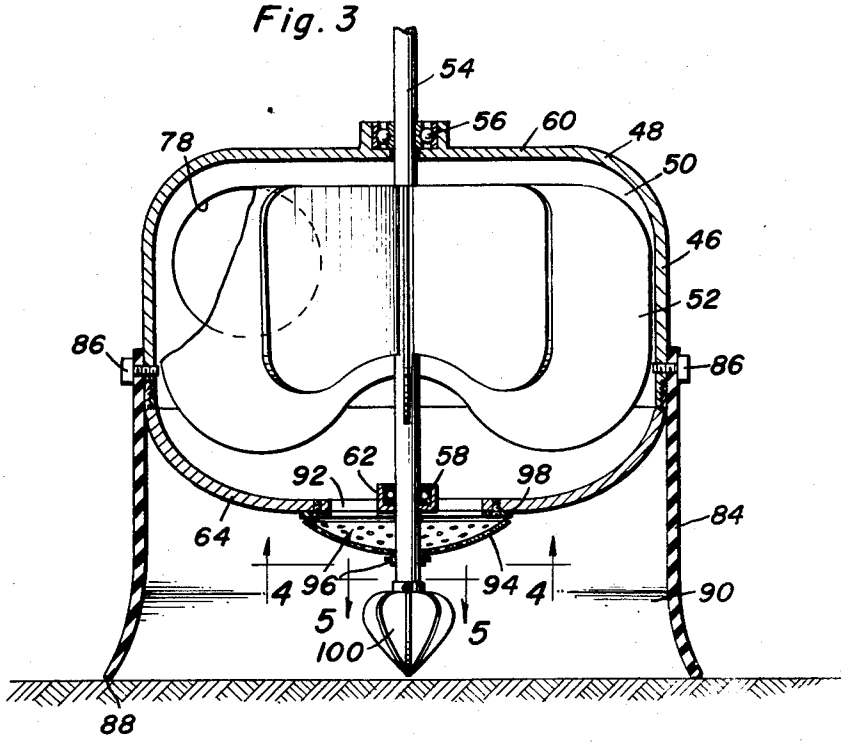


Fig. 4

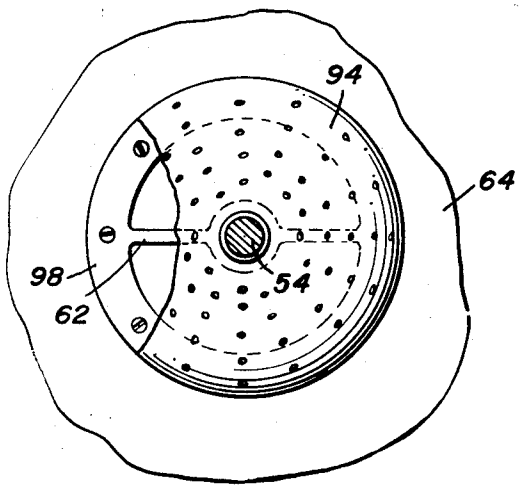
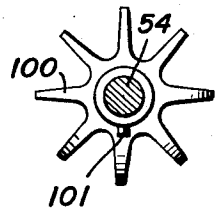


Fig. 5



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2,949,158

Patented Aug. 16, 1960

2,949,158

FIRE EXTINGUISHING MACHINE

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Filed Dec. 12, 1958, Ser. No. 780,114

4 Claims. (Cl. 169—1)

This invention relates to fire extinguishers and more particularly to a machine for gathering fire smothering substance, for instance sand, soil or the like, and expelling it in a direction to cover the fire.

One of the principal objects of the invention is to provide a machine for aiding amateur, volunteer or professional firemen in extinguishing fires.

Another object of the invention is to provide a portable machine which, through the action of a high vacuum, draws sand, soil or other fire smothering substance from the ground, screening the substance as it is passed through the machine, and then expelling the substance in a selected direction.

A more particular object of the invention is to provide a machine as aforesaid, wherein there is a vacuum chamber with which a screen soil or sand inlet is registered, together with a discharge hose connected to the vacuum chamber so that the collected soil, sand, etc. may be expelled through the discharge hose toward the fire.

An important feature of the invention is an agitator which is connected to the main drive shaft of the machine and which is adapted to bore into the soil to loosen it so that it may be sucked into the vacuum chamber and ultimately delivered to the discharge hose.

Another feature of the invention is found in the skirt which forms an enclosure around the lower part of the machine. This skirt is adapted to seat on the ground so that the suction is essentially contained in a region beneath the machine casing so that it will work in picking up the soil, delivering it through a screen and then expelling it through a discharge hose.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a front view of the machine constructed in accordance with the invention.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figure 3 is an enlarged sectional view of the vacuum chamber of the machine and other parts associated with it.

Figure 4 is an enlarged sectional view taken on the line 4—4 of Figure 3.

Figure 5 is a sectional view on an enlarged scale and taken on the line 5—5 of Figure 3.

In the accompanying drawings there is a fire extinguishing machine 10 constructed of a frame 12 having frame members 14 and 16 together with a handle 18 attached to the frame members. The illustrated machine, then, is for a walking attendant, although the principles of the invention are equally applicable in much larger scale machines and in smaller scale machines. Braces 22 and 24 are attached to sides 14 and 16 and to a metal hood or guard 26 intermediate its upper and lower ends.

The lower end of the hood or guard, for the protection of the firemen, is secured to downturned ends 28 of the frame sides 14 and 16 by bolts 30 or like, conventional fasteners. An axle 32 is carried by bearings 34 which are also secured to the downturned ends 28 of the sides 14 and 16. There are wheels 38 and 40 secured to the axle and adapted to contact the ground for the support of the machine. Only two wheels are used so that the weight of the machine may be partially rested on vacuum unit 46 which is attached to frame 12.

The vacuum unit 46 is made of a housing 48 enclosing a vacuum chamber 50 having air impeller 52 mounted for rotation therein. The air impeller is attached to a shaft 54, the latter extending through anti-friction bearings 56 and 58 which are carried by the upper wall 60 and a transverse member 62 on the lower wall 64 of the machine vacuum unit housing 48. The upper end of shaft 54 has an overriding clutch 66 connected with it, the overriding clutch coupling shaft 54 to shaft 68 extending from engine 70. The internal combustion engine 70 is attached to the frame sides 14 and 16 and is located above the unit 46 so that the weight of the motor presses downwardly to aid in keeping the vacuum unit in engagement with the ground.

Housing 48 is attached by mounting brackets 74 to the sides 14 and 16 respectively of frame 12. Wing nuts may be used with bolts for ready attachment and detaching of the housing 48. This locates the housing adjacent to the ground, this being necessary for the functioning of the fire extinguishing machine. Further, housing 48 has a short pipe 80 attached in registry with a discharge outlet 78 in one wall thereof. Flexible hose 82 is attached to pipe 80 and may be directed in any desired manner by simply flexing it in any direction. A support bracket 83 is attached to the front part of frame 12 and to the hose or conduit 82 to help support it on the frame of the machine.

A flexible skirt 84 is attached at its upper end, for instance by screws 86 to the side wall of housing 48. The lower edge 88 of flexible skirt 84 is used for contacting the ground so that the zone 90 enclosed by the skirt 84 and lower wall 64 of housing 48, may be kept under a suction or negative pressure when the air impeller 52 is rotated. Air is drawn through air and soil or sand inlet 92 across which transverse brace 62 extends. The air inlet 92 is protected by a screen or other type of sieve 94 that is attached to the lower part of shaft 54 and that is located on the exterior of housing 48. The sieve is in the shape of a partial sphere and has a hub 96 which is keyed, pinned or otherwise secured to shaft 54 so that the sieve rotates with the air impeller and shaft 54. Since the sieve is opposed to the air inlet opening 92, any air drawn through the opening 92 by the action of the suction drawn in chamber 50, is thoroughly sifted so that debris is excluded from the vacuum chamber 50. The rotation of the sieve keeps it clean. A thrust bearing collar 98 is attached to the lower part of wall 64 and has the sieve 94 come into contact therewith should any excessive end play exist in shaft 54.

There is an auger 100 attached to the lower extremity of shaft 54 by means of a setscrew 101 or the like. The auger is adapted to churn or dig up the soil, sand, etc. by having the user of the machine press downwardly on handle 18 thereby pushing shaft 54 toward the soil surface. The flexible skirt 84 preferably made of rubber or a like substance, yields enough to have the digger 100 function to stir up any hard deposits of sand or soil.

In use of the machine an attendant merely moves the machine adjacent to the fire and remains behind the protective shield 26. The engine 70 is started thereby rotating the air impeller 52, digger 100 and sieve 94. A

suction is drawn in vacuum chamber **50** thereby drawing air from chamber **90** and with this air there is an appreciable quantity of any loose sand or soil. The loose sand or soil is sifted as it passes through sieve **94** and then passes through chamber **50** and hose **82** in order to be applied onto the fire and smother it. Parts of sand or soil too large to pass through the sieve **94** are thrown off the sieve by rotation thereof to prevent clogging of the sieve. When hard deposits are encountered, the handle **18** is simply depressed sufficiently to have skirt **84** flex slightly. This moves the digger **100** down so that it engages the hard deposits, breaking it and enabling the sand, dirt, etc. to be drawn by vacuum in the chamber **50** and subsequently expelled through hose **82**.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A mobile fire extinguishing machine comprising a vacuum unit having a flexible depending skirt, a housing to which said flexible skirt is secured, said housing enclosing a vacuum chamber, a bottom inlet in said vacuum chamber housing and within the confines of the flexible skirt, a hose connected with said chamber whereby upon placement of said skirt onto a surface containing sand and the like, air laden sand is drawn through said air inlet and into said chamber and expelled through said hose, an air impeller in said vacuum chamber and having an upright shaft, an extremity of said shaft protruding upwardly of said chamber and adapted to be rotated by a source of power, and a sieve extending across said air inlet to sift the sand laden air as it passes into said vacuum chamber, said sieve being fixed on said shaft for rotation thereby to throw off particles of sand too large to pass through the sieve.

2. A mobile fire extinguishing machine adapted to be supported by a dirt surface comprising a vacuum unit including a housing, a flexible skirt depending from said housing and engaged with said surface, a chamber defined in said housing, an air inlet communicating said chamber with the confines of said skirt, vacuum means supported in said housing for evacuating said chamber, an outlet hose connected to said chamber whereby material drawn into said chamber due to said evacuation may be expelled through said hose, said vacuum means including an air impeller in said chamber having a shaft secured thereto, said shaft extending outwardly of said housing, and a power source carried by said housing for driving said shaft.

3. A mobile fire extinguishing machine adapted to be supported by a dirt surface comprising a vacuum unit including a housing, a flexible skirt depending from said housing and engaged with said surface, a chamber defined in said housing, an air inlet communicating said chamber with the confines of said skirt, vacuum means supported in said housing for evacuating said chamber, an outlet hose connected to said chamber whereby material drawn into said chamber due to said evacuation may be expelled through said hose, said vacuum means including an air impeller in said chamber having a shaft secured thereto, said shaft extending outwardly of said housing, and a power source carried by said housing for driving said shaft, an auger, said auger secured to said shaft on the lower end thereof for engagement with said surface.

4. A mobile fire extinguishing machine adapted to be supported by a dirt surface comprising a vacuum unit including a housing, a flexible skirt depending from said housing and engaged with said surface, a chamber defined in said housing, an air inlet communicating said chamber with the confines of said skirt, vacuum means supported in said housing for evacuating said chamber, an outlet hose connected to said chamber whereby material drawn into said chamber due to said evacuation may be expelled through said hose, said vacuum means including an air impeller in said chamber having a shaft secured thereto, said shaft extending outwardly of said housing, and a power source carried by said housing for driving said shaft, an auger, said auger secured to said shaft on the lower end thereof for engagement with said surface, and a sieve supported by said shaft and extending across said air inlet to sift air passing into said chamber.

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