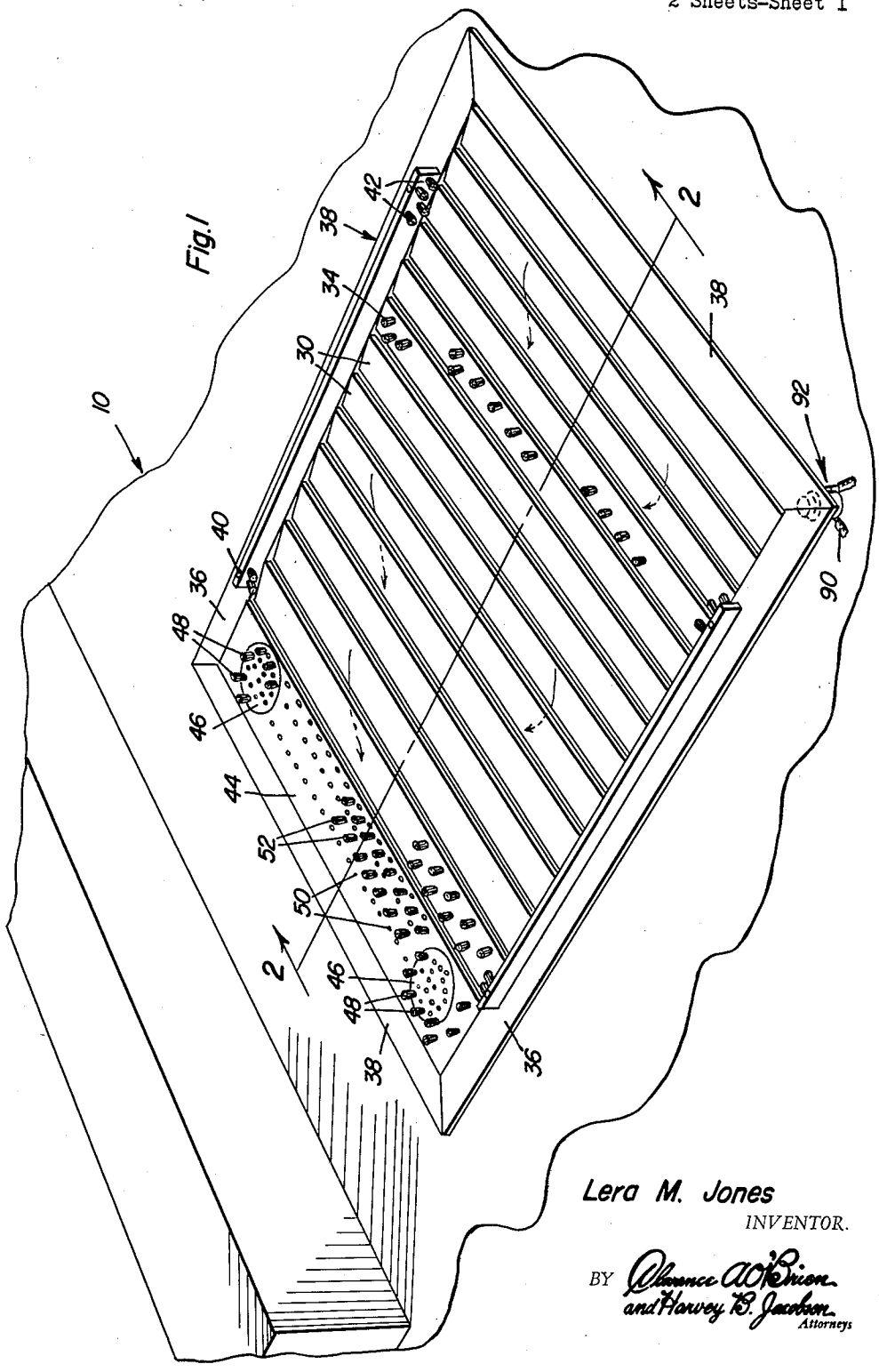
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VACUUM DOOR MAT

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Fig. 1



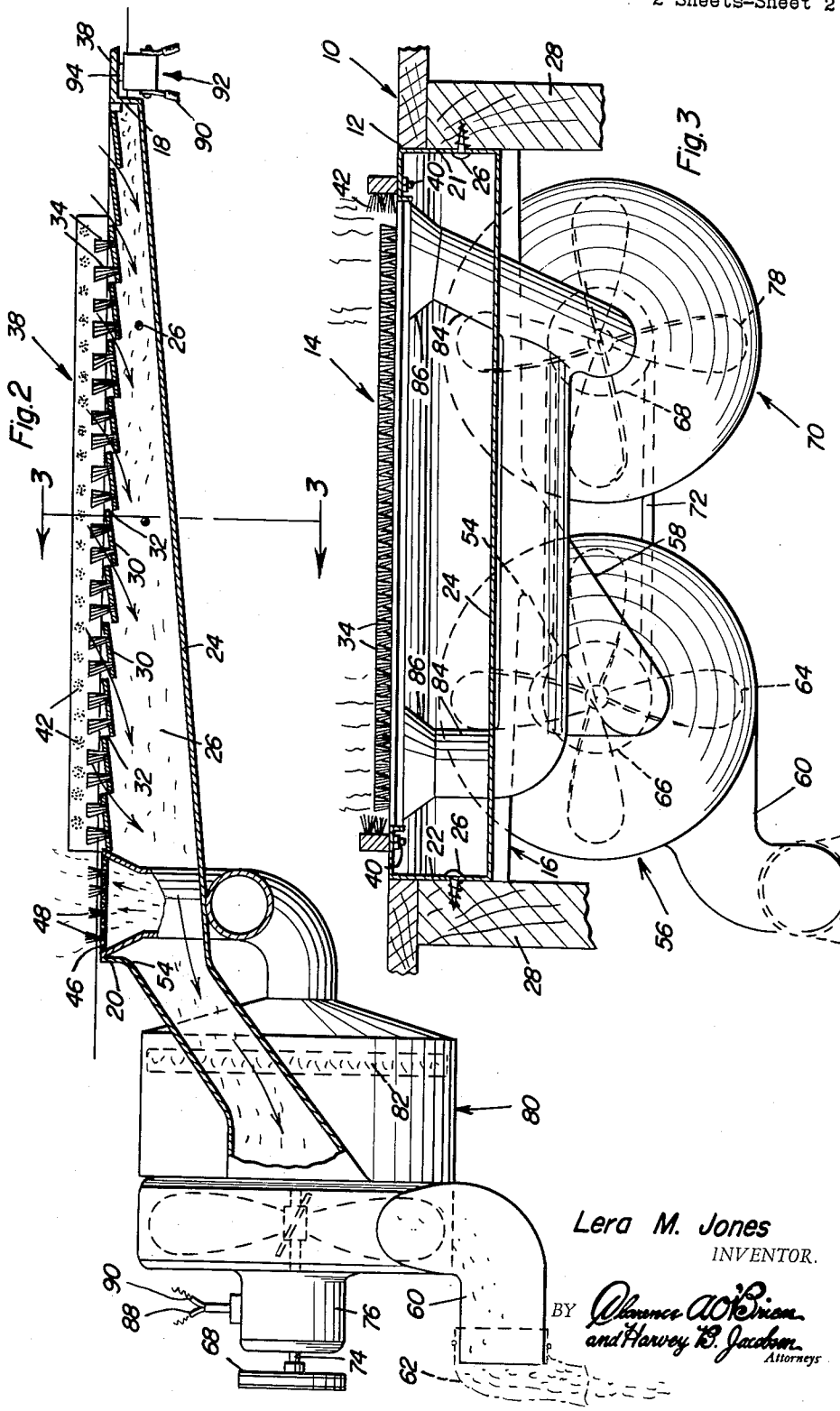
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VACUUM DOOR MAT

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7 Claims. (Cl. 15—310)

This invention relates to a novel and useful vacuum door mat and more particularly to a door mat provided with brush means and motorized blower means for effecting a partial vacuum whereby the soil removed from shoes by the brush means may be drawn to a suitable collection point.

The vacuum door mat of the instant invention includes a mounting frame adapted to be recessed in an opening in a section of flooring and the mounting frame includes pressure sensitive switch means for actuating the motor means of the blower means in response to weight being placed upon the mounting frame.

In addition to being provided with means for effecting a vacuum in order to draw off the soil removed from shoes by the brush means, the vacuum door mat also includes blower means including an electrical heating element for exhausting heated air whereby snow and ice may be melted from shoes positioned on the door mat. The brush means of the floor mat comprises a plurality of bar-like brush heads extending transversely across the mounting frame and each of the brush heads is provided with upwardly extending bristle means for engagement with the undersurface of a shoe or the like placed on the door mat. Still further, the mounting frame is provided with a pair of inwardly directed opposing elongated brush members extending along opposite marginal edge portions of the mounting frame and these elongated brush members project above the brush heads extending transversely of the mounting frame whereby the elongated brush members may be utilized to remove dirt from the sides of shoes supported by the door mat.

The mounting frame comprises an open top receptacle having opposite side and end walls connected together at their lower ends by means of an inclined bottom wall inclining downwardly toward the rear end of the receptacle. The vacuum blower means is communicated with the lower rear end of the receptacle and the flat bar-like brush heads extending transversely of the mounting frame are inclined about their longitudinal axes and have their side edges disposed in overlapping and vertically spaced relation relative to the adjacent side edges of adjacent bar-like heads.

The main object of this invention is to provide a vacuum door mat specifically adapted to remove and collect dirt from the sides and bottom surfaces of shoes positioned on the door mat.

A further object of this invention, in accordance with the immediately preceding object, is to provide a vacuum door mat adapted to also direct a discharge of heated air upwardly through the forward end portion of the door mat whereby ice and snow clinging to shoes positioned on the door mat may be melted.

A still further object of this invention is to provide an actuating switch for the motor means utilized as a power source for the blower and vacuum means specifically adapted to be actuated in response to weight being disposed on the door mat.

A final object to be specifically enumerated herein is to provide a vacuum door mat which will conform to conventional forms of manufacture, be of simple construction and automatic in operation so as to provide a device that will be economically feasible, long lasting and relatively trouble free in operation.

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 perspective view of the vacuum door mat shown recessed in an opening in a section of flooring;

FIGURE 2 is an enlarged longitudinal vertical sectional view taken substantially upon the plane indicated by the section line 2—2 of FIGURE 1; and

FIGURE 3 is an enlarged transverse vertical sectional view taken substantially upon the plane indicated by the section line 3—3 of FIGURE 2.

Referring now more specifically to the drawings, the numeral 10 generally designates a section of flooring in which there has been formed an opening 12. The vacuum door mat of the instant invention is generally designated by the reference numeral 14 and includes a mounting frame generally referred to by the reference numeral 16. The mounting frame 16 includes opposite end walls 18 and 20 and opposite side walls 21 and 22. The end walls 18 and 20 and the side walls 21 and 22 are interconnected at their lower ends by means of an inclined bottom wall 24. The bottom wall 24 is inclined downwardly toward the rear end of the frame 16.

The frame 16 is secured within the opening 12 by means of suitable fasteners 26 secured through the side walls 21 and 22 and engaged with the flooring supporting joists 28.

The frame 16 includes a plurality of elongated and flat bar-like heads 30 which are secured between the opposite side marginal portions of the frame 16 in any convenient manner. The bar-like heads 30 are disposed in side-by-side relation and are downwardly inclined toward the rear end of the frame 16. It will be noted that the side edges of each head 30 overlap and are vertically spaced from the adjacent side edges of adjacent heads 30 whereby air intake slots 32 are formed between adjacent heads 30. Each of the heads 30 includes a plurality of brush bristles 34 which extend upwardly therefrom and are adapted to engage the undersurfaces of shoes and the like supported by the frame 16.

The frame 16 includes opposite side horizontally disposed marginal edge members 36 and opposite edge marginal edge members 38. Each of the marginal edge members 36 has an elongated and inwardly directed brush member generally referred to by the reference numeral 38 fixedly secured thereto by means of fasteners 40. Each of the brush members 38 includes a plurality of inwardly directed bristle members 42 which are adapted to engage the sides of shoes and the like supported by the frame 16 in order to remove dirt from the side surfaces of the shoes. Accordingly, it may be observed that the bristle members 34 and 42 may be utilized to brush soil from the under-surfaces and side surfaces respectively of shoes and the like supported by the frame 16. The rear end of the frame 16 has a transversely extending plate 44 secured thereacross and the plate 44 includes a pair of apertured plug members 46 which also include upwardly extending bristle members 48. In addition, the plate 44 also includes a plurality of apertures 50 and a plurality of upwardly directed bristle elements 52.

The central portion of the lower edge of the rear wall 20 is provided with an outlet opening 54 and a vacuum blower assembly generally referred to by the reference numeral 56 includes an inlet conduit 58 opening into the receptacle by means of the outlet opening 54. The blower assembly 56 includes an outlet neck portion 60 whose free end is provided with a dirt trap or receptacle 62. It is to be understood that in place of the receptacle 62 a discharge conduit could be secured to the neck por-

tion 60 having an outlet end located exteriorly of the building in which the flooring section 10 is disposed.

The blower assembly 56 is provided with a rotatably suported blower blade assembly 64 which includes a driving pulley 66 that is drivingly connected to a driving pulley 68 connected to the blower assembly 70. The pulleys 66 and 68 are drivingly connected by means of an endless flexible belt 72 and it will be noted that the pulley 68 is secured to one end of a driving shaft 74 extending through the rear end of the electric motor 76. The electric motor 76 comprises the motive force for the blower blade 78 carried by the end of the shaft 74 remote from the pulley 68. The blower assembly 70 may be provided with any suitable inlet means and it includes a discharge conduit generally referred to by the reference numeral 80 having an electrical heating element 82 disposed therein. The outlet conduit 80 includes two branch conduits 84 which terminate at their free ends in funnel-like end portions 86 whose major diameter portions snugly receive the plug members 46. Accordingly, the branch conduits 84 deliver heated air to the apertured plug members 46. In this manner, heated air may be used to melt accumulated snow and ice from the soles of shoes positioned over the plate 44.

The electric motor 76 is operatively connected to any suitable source of electrical potential by means of conductors 88 and 90 and a pressure sensitive switch generally referred to by the reference numeral 92 is disposed in the conductor 90 and includes an actuator 94 for closing spaced contacts (not shown) within the switch 92 in response to downward movement of the forward marginal edge portion 38. It will be understood that the frame 16 is mounted in the opening 12 in a manner whereby a predetermined amount of weight positioned on the frame 16 will effect sufficient downward movement of the forward marginal portion 38 of the frame 16 to depress the actuator 94 whereby the motor 76 will be actuated. The electrical heating element 82 may be connected in series to either one of the conductors 88 and 90 whereby it may be actuated together with the motor 76 in response to downward movement of the actuator 94 of the switch 92.

If it is desired, a manually operable switch may be operatively associated with the electrical heating element 82 in a manner whereby the heating element 82 may be temporarily disconnected from the switch 92 during the seasons when the operation of the heating element 82 will not be required. The heating element 82 and the blower assembly may also be used to dry shoes in wet weather and may also be used for drying clothes. Further, the plug members 46 may be removed and a hose may be secured at one end to the end portions 86 whereby the hose may then be used as a hair dryer.

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 vacuum door mat comprising a mounting frame adapted to be recessed in an opening in a section of flooring, said mounting frame comprising an open topped receptacle having opposite side and end walls connected together at their lower ends by means of an inclined bottom wall, a plurality of elongated flat bar-like support heads extending and secured between opposite side walls of said receptacle, at least some of said bar heads including upstanding bristles, said heads being slightly rotated about their longitudinal axes and slightly downwardly inclined at corresponding side edges, vacuum outlet means communicated with the lower end of said bottom wall, and vacuum blower means including an inlet conduit communicated with said outlet means.

2. The combination of claim 1 wherein said vacuum blower means includes outlet means provided with filter trap means for collecting the dirt removed from shoes by said door mat.

3. The combination of claim 1 wherein said mounting frame includes a pair of inwardly directed opposing elongated brush members extending along opposite marginal edge portions and projecting upwardly above said brush heads adapted to remove dirt from the sides of shoes supported by said frame.

4. The combination of claim 1 wherein side edges of said bar-like heads overlap the side edges of adjacent bar-like heads and are spaced vertically therefrom.

5. The combination of claim 1 wherein said vacuum blower means includes outlet means provided with filter trap means for collecting the dirt removed from shoes by said door mat, said vacuum blower means including motor means, said frame including weight responsive switch means operatively connected to said motor means and operable in response to weight disposed on said frame for effecting operation of said motor means.

6. The combination of claim 1 including at least one upwardly opening outlet means carried by one end of said frame, second blower means including discharge conduit means connected with said outlet means, heater means in said discharge conduit means, said second blower means operatively connected to said motor means, said heater means being disposed in an electrical actuating circuit, and switch means operatively connected to said actuating circuit for closing the latter in response to weight being placed on said frame.

7. The combination of claim 1 wherein said bar-like support heads are inclined downwardly toward the lower end of said bottom wall.

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