

[54] **MAGNETIC-PICKUP-DEVICE**

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[51] Int. Cl. **H01f 7/20**

[58] Field of Search 335/285, 302; 209/215; 15/105; 294/65.5

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[57] **ABSTRACT**

A hand-operated device for collecting and picking up metal objects, as pins, nails, clips or the like. The device has a crosshead secured to the lower end of an elongated handle. A U-shaped channel of magnetic material is secured to the bottom of the crosshead. A bar having magnetic properties is located within the channel establishing a flux force field in the channel operative to pick up and hold magnetic metal objects on the channel.

8 Claims, 7 Drawing Figures

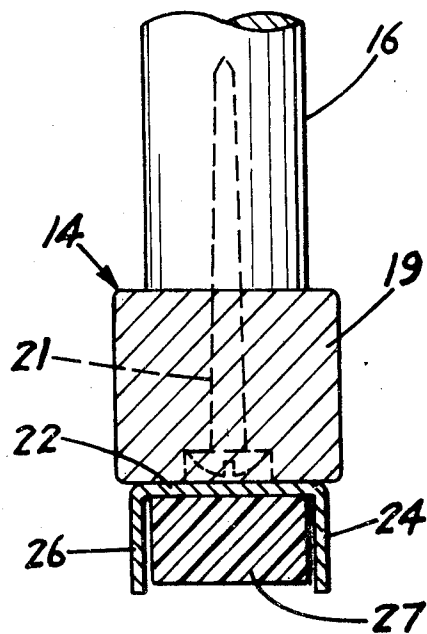


FIG. 1

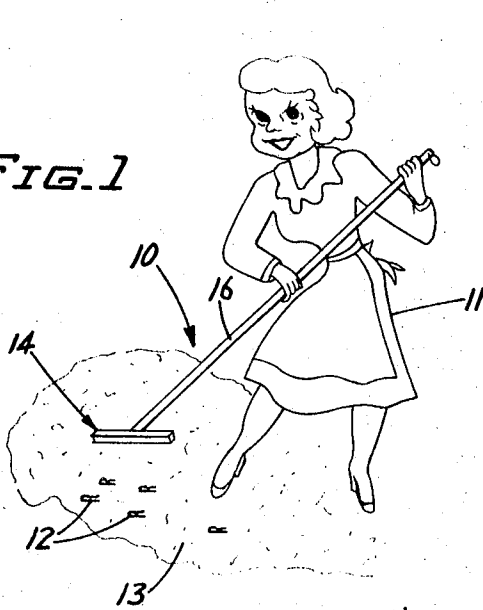


FIG. 2

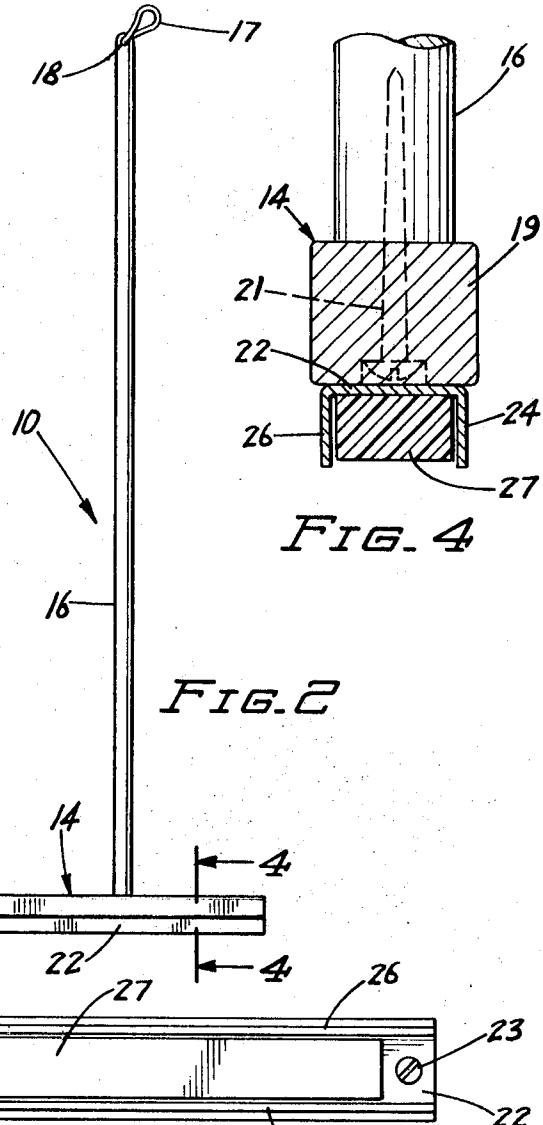


FIG. 4

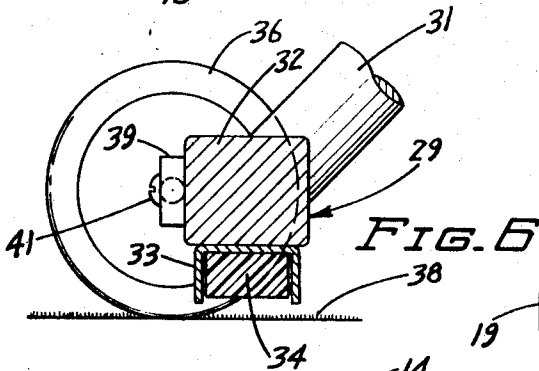


FIG. 3

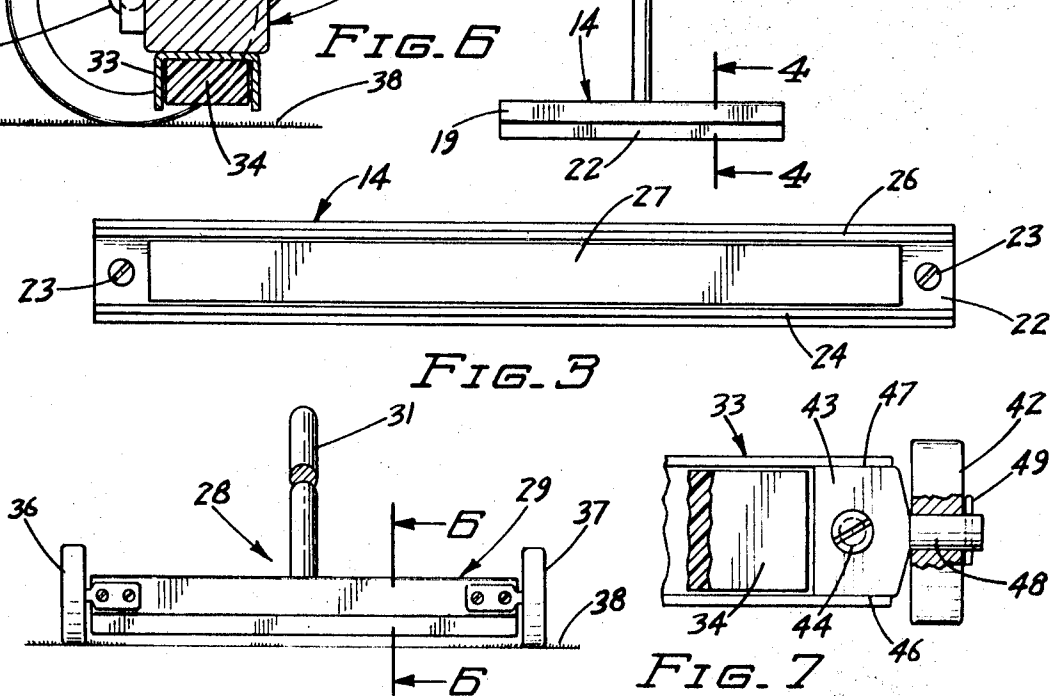
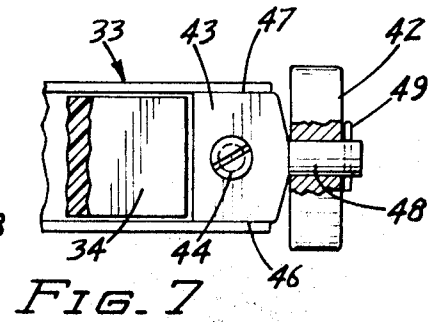
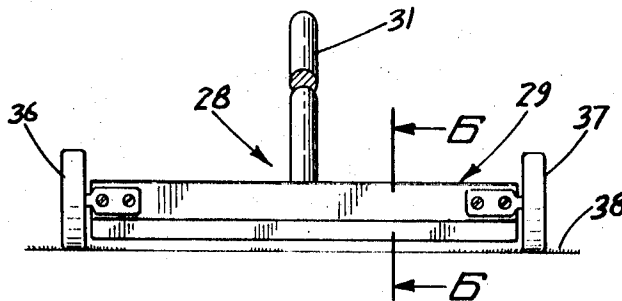


FIG. 5



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MAGNETIC-PICKUP-DEVICE

BACKGROUND OF INVENTION

The gathering and picking up of relatively small metal objects from a floor, particularly a carpeted floor, cannot be done effectively with an ordinary broom. A broom does not pick up nor classify the metal objects from other dirt and debris on the floor. A conventional vacuum cleaner cannot be used to pick up metal objects, as these objects will either jam the cleaner or pierce the collection containers. Industrial sweepers and machinery have been provided with magnetic pick-ups to remove metal objects so that they do not harm the machines. These magnetic pickups are built right into the machines and are not designed to be used as a separate hand-operated device.

In numerous environmental situations, as in the home, school, wig shops and beauty salons, relatively small metal objects, as clips, hairpins, needles, nails and tacks, invariably find their way to the floor. When the floors are carpeted, it is a time consuming task to bend and pick up these metal objects. The present invention is designed to eliminate the bending, stooping and searching for metal objects which may be on the floor.

SUMMARY OF INVENTION

The invention is directed to a hand-operated device for picking up objects of magnetizable metal from a location in an efficient and effective manner. The device has a crosshead or transverse member carrying an elongated upright handle. Attached to the bottom of the crosshead is a magnetic pickup unit having a generally U-shaped channel member secured to a transverse nonmagnetic support. A bar means having magnetic characteristics is located within the channel. The bar means establishes a magnetic force field in the channel which is sufficient to pick up and hold the metal objects on the channel. In one form of the invention, outer ends of the crosshead carry wheels. The wheels rotatably support the crosshead so that the magnetic pickup unit is maintained a short distance above the floor and can be moved over the floor in an easy and convenient manner.

IN THE DRAWINGS

FIG. 1 is a perspective view of the pickup device of the invention used to pick up metal objects from a carpet;

FIG. 2 is a front elevational view of the pickup device;

FIG. 3 is an enlarged bottom plan view of the pickup device;

FIG. 4 is an enlarged cross-sectional view taken along the line 4-4 of FIG. 1;

FIG. 5 is a foreshortened elevational view of a modification of the pickup device;

FIG. 6 is an enlarged cross-sectional view taken along the line 6-6 of FIG. 5; and

FIG. 7 is an enlarged bottom plan view of one end of the pickup device showing a modification of the wheel mounting structure.

Referring to the drawings, there is shown in FIG. 1 an example of one particular use of the pickup device 10 of the invention. The pickup device 10 is being used by an operator 11 to pick up magnetic metal objects 12, as pins or clips, from a carpet 13. The use of the pickup device 10 is not intended to be limited to the environment illustrated in FIG. 1. The pickup device 10 is usable in the home, school, shop, salons and other places to pick up metal needles, nails, pins, clips, tacks, hairpins, and similar magnetic materials. The pickup device 10 is particularly useful in environments where it is necessary to separate metal objects from nonmetal or nonmagnetic substances, as dirt, chaff and the like, and to collect and pick up metal objects from a carpet.

Referring to FIG. 2, the pickup device 10 has a transverse crosshead or member 14 carrying an upright handle 16. A looped cord 17, as a rope, rawhide or the like, is threaded through a hole 18 in the upper end of the handle to provide a loop for hanging the device on a peg or bracket. The lower

end of handle 16 is secured to the center of the crosshead 14. The crosshead 14 and handle 16 form a generally inverted T-shaped design. The handle 16 is substantially longer than the transverse length of the crosshead 14. For example, the handle 16 is shown to have a length about three times the length of the crosshead 14. The length of the handle 16 is such that the operator 11 can conveniently pick up the objects 12 without bending or stooping. It has been found that a handle with a length of from 36 to 50 inches is suitable to eliminate excessive body movement and manipulation when picking up the objects 12.

Referring to FIG. 4, the crosshead 14 has a transverse base or support member 19 carrying the handle 16. An upright fastener 21, as a screw or the like, extends through the center portion of the member 19 and into the lower end of the handle 16 to secure the handle to the crosshead. The support member 19 is formed from rigid nonmagnetic material, as wood, plastic, aluminum or the like. As an alternative structure for attaching the handle to the crosshead, the lower end of the handle may have a longitudinal threaded portion which is turned into a threaded opening in the member 19. Also, a connecting bracket can be used to secure the handle to the crosshead.

As shown in FIGS. 2, 3 and 4, a metal channel or U-shaped member 22 extends along the bottom of the support member 19. Fasteners 23, as screws, extend through opposite ends of the base of the channel and into the member 19 to attach the channel to the member 19. The channel 22 has downwardly directed parallel sidewalls 24 and 26 providing a downwardly open cavity or groove. An elongated bar 27 is located in the groove between the sidewalls 24 and 26. As shown in FIG. 3, the bar 27 extends substantially the full length of the channel. The bar 27 is a plastic material holding disbursed discrete magnetized particles which make the bar a permanent magnet. For example, the plastic material can be polyvinyl chloride having a barium ferrite filler. This composite has magnetic properties. The magnetic force of the bar 27 holds the bar in assembled relation with the channel 22. Bar 27 can be removed for cleaning or replaced by forcing the bar out of the channel without removing any fasteners, latches or the like. Bar 27 can be a metal magnet located between the sidewalls 24 and 26.

As shown in FIG. 4, the thickness of the bar 27 is less than the width of the sidewalls 24 and 26 so that the bar 27 is retained in a protective position on the channel and does not interfere with the collection of the objects on the bottom ends of the sidewalls 24 and 26. The channel 22 is of metal susceptible to magnetizing so that the bar 27, being a magnet, will set up a flux force field in the channel 22 which has sufficient strength to attract and hold magnetic metals, as iron, steel and the like.

In use, the pickup device 10 is hand operated with the crosshead 14 facing the carpet 13. As shown in FIG. 1, the operator 11 moves the crosshead 14 over the objects 12. The magnetic flux force field in the channel 22 will attract and hold the metal objects across the ends of the channel, thereby separating the metal objects from other dirt and debris which may be on the carpet. The objects collected on the channel are manually removed into a container or another selected location which is convenient to the operator.

Referring to FIGS. 5 and 6, there is shown a modification of the pickup device, indicated generally at 28. Pickup device 28 has a transverse crosshead 29 carrying an upwardly directed handle 31. The crosshead 29 has a rigid transverse base 32 of nonmagnetic material, as wood or plastic. Secured to the bottom of the base 32 is a downwardly open channel 33. A bar magnet 34 is located in the channel similar to the bar magnet shown in FIG. 4. Mounted on the opposite ends of the base 32 are wheels 36 and 37 which rotatably support the device a short distance above the carpet 38. Separate brackets 39 are used to attach the wheels to the opposite ends of the base 32. Fasteners 41, as screws, bolts and the like, are used to attach the brackets to the side of the base 32. The handle 31 is at

tached to the center portion of the base 32 so as to extend upwardly and rearwardly at a slight angle. In this manner, the crosshead 29 can be conveniently used in front of the operator with the channel 33 facing in a downward direction toward the carpet 38.

Referring to FIG. 7, there is shown a modification of a mount used to connect the wheel 42 to the end of the crosshead. A mount 43, located in the channel 33 adjacent the end of the bar 34, is secured to the channel 33 and base 32 with a single fastener 44, as a screw. The mount has side edges located closely adjacent the sidewalls 46 and 47 of the channel to prevent angular movement of the mount relative to the channel. The mount 43 has an outwardly projected axle 48 rotatably carrying the wheel 42. A snap ring 49 on the end of the axle maintains the wheel 42 in assembled relation with the mount.

While there have been shown and described preferred embodiments of the invention, it is understood that various changes in materials, shape and size may be made by those skilled in the art without departing from the invention. For example, the axles for the wheels in FIGS. 5 to 7 may extend from opposite ends of the base 32. The axles for the wheels may be secured to and extend directly from the opposite ends of the transverse base 32. The wheels could be replaced with nonrotatable skids operative to hold the channel 33 a short distance above the carpet 38. The invention is defined in the following claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A device for collecting magnetic metal objects comprising: a transverse member of nonmagnetic material, an elongated handle secured to the center section of the transverse member to form therewith a generally T-shaped assembly, a downwardly open transverse channel member of magnetizable

metal secured to the bottom portion of the transverse member, said channel member having a length substantially the same as the length of the transverse member, said channel member having spaced substantially parallel sidewalls, and elongated bar means having magnetic characteristics located between the sidewalls, said bar means extending substantially the length of the channel member and magnetically retained on the channel member, whereby the channel member is magnetized so that when the channel member is positioned adjacent the metal objects, magnetic force collects the metal objects on the channel member.

2. The device of claim 1 wherein: the sidewalls are longer than the thickness of the elongated bar means, whereby the sidewalls extend downwardly from the plane of the bottom surface of the bar means.

3. The device of claim 2 wherein: the elongated bar means is a generally flat bar of plastic material having a filler with magnetic properties.

4. The device of claim 1 wherein: the handle is at least three times as long as the transverse member.

5. The device of claim 1 including: wheel means mounted on opposite end portions of the transverse member to position the channel member above a supporting surface.

6. The device of claim 5 including: mounts rotatably carrying the wheel means and means attaching the mounts to the transverse member.

7. The device of claim 5 including: mounts rotatably carrying the wheel means, said mounts having portions located between the sidewalls of the channel member, and fastening means securing the mounts to the channel member and the channel member to the transverse member.

8. The device of claim 7 wherein: the fastening means comprise a single threaded member for each mount.

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