PORTABLE SNOW BLOWER

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ABSTRACT
An apparatus for removal of at least one of snow and ice from a surface includes a housing having a predetermined shape, at least one intake port and a discharge port and a handle engageable with the housing for carrying and operating the apparatus. A heating member is mounted adjacent the discharge port and a powered blower is disposed within the housing for drawing air through at least one intake port and exhausting the air through at least a portion of the heating means and through the discharge port, whereby the exhausted air is heated by the heating means. A nozzle is engageable with the housing adjacent the discharge port for applying the exhausted heated air under pressure onto the at least one of snow and ice and a control switch is provided for selectively activating and deactivating the powered blower.
PORTABLE SNOW BLOWER

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is related to and claims priority from a provisional patent application Ser. No. 60/636,393 filed on Dec. 3, 2004.

FIELD OF THE INVENTION

[0002] The present invention relates, in general, to a portable hand carried snow and ice removal apparatus and, more particularly, this invention relates to a portable snow blower capable of providing heated air for melting snow and ice.

BACKGROUND OF THE INVENTION

[0003] As is generally well known, snow removal is accomplished either by using a shovel or a power operated ground engaging snow blower. Use of a shovel generates undesired stresses onto a lower back portion of the user and causes fatigue when large amounts of snow must be removed.

[0004] Use of a traditional ground engaging powered snow blower equipment alleviates the problem of lower back stresses and user fatigue. However, such equipment is difficult to maneuver and may be cumbersome for users with limited physical strength. Furthermore, traditional snow blowers are disadvantaged in cleaning elevated surfaces such as steps and porches.

[0005] Additionally, the use of a shovel or traditional snow blower equipment fails to completely remove snow and ice build up from the ground surface.

[0006] Attempts have been made to provide portable snow removal devices. U.S. Pat. No. 4,070,771 to Yakiewluk discloses a portable snow blower having a shaped housing fitted at its rear with an external handle and enclosing a powered air blower. The discharge opening of the blower is located at a forward tapered end section of the housing, with the opening extending across the top of the end section, and with the bottom portion of the end section of the housing being enclosed.

[0007] U.S. Pat. No. 4,378,644 to Tuggle et al teaches a hand carriable powered snow removal apparatus having an internal combustion engine power unit removably connected to one end of a tubular boom which supports an elongated drive shaft connected to the engine power take off shaft at and to a right angle drive gear unit mounted at the opposite end of the boom. The gear unit includes a housing mounted on the end of the boom and provides a centered drive arrangement for a pair of opposed paddle type impellers mounted on respective ends of an output shaft projecting from opposite sides of the gear housing. A shroud mounted on the gear housing includes an upwardly projecting rear wall and spaced apart lateral side walls partially enclosing the impellers and providing directional control for the snow being discharged from the impellers. A set of movable guide vanes is mounted on the forward end of the shroud and is adjustable to provide for varying the directional attitude of snow being discharged from the shroud.

[0008] U.S. Pat. No. 5,522,162 to Allison discloses a portable rotary snow blower shovel which uses the drive mechanism from a rotary string trimmer. In place of the string and string guard, the snow blower utilizes an impeller and a substantially cylindrical enclosure. The enclosure includes a cutout opening in a lower portion of the periphery to allow snow to enter. Adjacent the opening is a flat plate which is secured to the inside of the enclosure at an angle in order to direct snow upward toward the impeller. The impeller, which is oriented substantially parallel to the surface being cleared, is circular in shape and has radially projecting blades attached to the upper and lower surfaces thereof. Once the snow is directed upward by the angled flat plate, the blades of the impeller, which are rotating at a high speed, force the snow out an exit conduit adjacent the top of the cylindrical enclosure by centrifugal force. The exit conduit directs the snow upward and away from the path being cleared.

[0009] While the prior art portable snow removal devices are simple to operate, they fail to address complete removal of the snow and ice build-up from the surface.

[0010] Therefore, there is a need for an improved portable apparatus for removing snow and ice build-up and which significantly removes such snow and ice build-up.

SUMMARY OF THE INVENTION

[0011] The invention provides an apparatus for removal of at least one of snow and ice from a surface. Such apparatus includes a housing having a predetermined shape, at least one intake port and a discharge port. A handle is engageable with the housing for carrying and operating the apparatus. A heating member is operably mounted adjacent the discharge port. A powered blower is disposed within the housing for drawing air through the at least one intake port and exhausting the air through at least a portion of the heating means and through the discharge port, whereby the exhausted air is heated by the heating means. A nozzle having each of a predetermined size and a predetermined shape is operably engageable with the housing adjacent the discharge port for applying the exhausted heated air under pressure onto at least one of snow and ice for substantial removal of at least one of snow and ice from the surface. A control switch is provided for selectively activating and deactivating the powered blower means.

OBJECTS OF THE INVENTION

[0012] It is, therefore, one of the primary objects of the present invention to provide a portable apparatus for removal of snow and ice build-up.

[0013] Another object of the present invention is to provide a portable apparatus for removal of snow and ice build-up which significantly removes such snow and ice build-up from the surface.

[0014] Yet another object of the present invention is to provide a portable apparatus for removal of snow and ice build-up which is simple to use.

[0015] A further object of the present invention is to provide a portable apparatus for removal of snow and ice build-up which generates heated air.

[0016] An additional further object of the present invention is to provide a portable apparatus for removal of snow and ice build-up which is simple and economical to manufacture.
In addition to the several objects and advantages of the present invention which have been described with some degree of specificity above, various other objects and advantages of the invention will become more readily apparent to those persons who are skilled in the relevant art, particularly, when such description is taken in conjunction with the attached drawings and with the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation view of the apparatus for removal of at least one of snow and ice;

FIG. 2 is a partial cross-sectional view of the apparatus along lines 2-2 of FIG. 1; and

FIG. 3 is a partial perspective view of the battery recharging means for use with the apparatus of FIG. 1.

BRIEF DESCRIPTION OF THE VARIOUS EMBODIMENTS OF THE INVENTION

Prior to proceeding to the more detailed description of the present invention, it should be noted that, for the sake of clarity and understanding, identical components which have identical functions have been identified with identical reference numerals throughout the several views illustrated in the drawing figures.

Reference is now made to FIGS. 1-3, wherein there is shown an apparatus, generally designated 10, for removal of at least one of snow and ice 4 from a surface 2. The apparatus 10 includes a housing 20 having a predetermined shape, at least one intake port 22 and a discharge port 24. A handle 30 engages the housing 20 and is preferably formed integral to such housing 20. A second handle 32 may be provided for aiding in operating and carrying the apparatus 10. Preferably, the second handle 32 is pivotally attached to the housing 20. It will be appreciated that the user will grasp the handle 30 with one hand and the handle 32 with the other hand.

A heating means 40 is operably mounted within the housing 20 adjacent the discharge port 24 thereof. In the presently preferred embodiment of the invention, the heating means 40 is an electrically operable coil element 40.

A powered blower means 50 is disposed within the housing 20 for drawing air through at least one intake port 22 and exhausting the air through the heating means 40 and through the discharge port 24. Such exhausted air is heated by the heating means 40 during passage there-through.

In a further reference to FIG. 1, the apparatus 10 includes a nozzle 60 having each of a predetermined size and a predetermined shape. Such nozzle 60 is operably engageable with the housing 20 adjacent the discharge port 24 for applying the heated exhausted air under a predetermined pressure onto at least one of snow and ice 4 for removal of the at least one of snow and ice 4 from the surface 2. To generate such predetermined pressure, the free end 62 of the nozzle 60 is partially closed. The nozzle 60 may be removably attached to the housing 20 either by close fit or with the use of fasteners or clamps (not shown), which is advantageous for storing such apparatus 10 in close confines and for heating a larger portion of the surface 2. Alternatively, the nozzle 60 may be formed integral to the housing 20.

FIG. 6 shows the heating means 40 and blower means 50 of the invention in an exploded view. FIG. 7 shows the housing 20 and nozzle 60 in a perspective view. FIG. 8 shows the nozzle 60 in a perspective view. FIG. 9 shows the nozzle 60 in a perspective view. FIG. 10 shows the housing 20 in a perspective view. FIG. 11 shows a portion of the housing 20 in a perspective view. FIG. 12 shows the heating means 40 in a perspective view. FIG. 13 shows the heating means 40 in a perspective view. FIG. 14 shows the heating means 40 in a perspective view. FIG. 15 shows the heating means 40 in a perspective view. FIG. 16 shows the heating means 40 in a perspective view. FIG. 17 shows the heating means 40 in a perspective view. FIG. 18 shows the heating means 40 in a perspective view. FIG. 19 shows the heating means 40 in a perspective view. FIG. 20 shows the heating means 40 in a perspective view. FIG. 21 shows the heating means 40 in a perspective view. 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FIG. 90 shows the heating means 40 in a perspective view. FIG. 91 shows the heating means 40 in a perspective view. FIG. 92 shows the heating means 40 in a perspective view. FIG. 93 shows the heating means 40 in a perspective view. FIG. 94 shows the heating means 40 in a perspective view. FIG. 95 shows the heating means 40 in a perspective view. FIG. 96 shows the heating means 40 in a perspective view. FIG. 97 shows the heating means 40 in a perspective view. FIG. 98 shows the heating means 40 in a perspective view. FIG. 99 shows the heating means 40 in a perspective view. FIG. 100 shows the heating means 40 in a perspective view. FIG. 101 shows the heating means 40 in a perspective view. FIG. 102 shows the heating means 40 in a perspective view. FIG. 103 shows the heating means 40 in a perspective view. FIG. 104 shows the heating means 40 in a perspective view. FIG. 105 shows the heating means 40 in a perspective view. FIG. 106 shows the heating means 40 in a perspective view. FIG. 107 shows the heating means 40 in a perspective view. FIG. 108 shows the heating means 40 in a perspective view. FIG. 109 shows the heating means 40 in a perspective view. FIG. 110 shows the heating means 40 in a perspective view. FIG. 111 shows the heating means 40 in a perspective view. FIG. 112 shows the heating means 40 in a perspective view. FIG. 113 shows the heating means 40 in a perspective view.
person skilled in the art to which it pertains to make and use the same. It will be understood that variations, modifications, equivalents and substitutions for components of the specifically described embodiments of the invention may be made by those skilled in the art without departing from the spirit and scope of the invention as set forth in the appended claims.

1. An apparatus for removal of at least one of snow and ice from a surface, said apparatus comprising:
   (a) a housing having a predetermined shape, at least one intake port and a discharge port;
   (b) a handle means engageable with said housing for carrying and operating said apparatus for removal of said at least one of snow and ice;
   (c) a heating means mounted adjacent said discharge port; and
   (d) a powered blower means disposed within said housing for drawing air through said at least one intake port and exhausting said air through at least a portion of said heating means and through said discharge port, whereby said exhausted air is heated by said heating means.

2. The apparatus, according to claim 1, wherein said apparatus further includes a nozzle having each of a predetermined size and a predetermined shape, said nozzle operably engageable with said housing adjacent said discharge port for applying said exhausted heated air under pressure onto said at least one of snow and ice for removal of said at least one of snow and ice from said surface.

3. The apparatus, according to claim 2, wherein said nozzle is one of removably attached and integral to said housing.

4. The apparatus, according to claim 2, wherein said nozzle includes insulating means for protecting a user of said apparatus from said exhausted heated air.

5. The apparatus, according to claim 4, wherein said insulating means is a material of said nozzle.

6. The apparatus, according to claim 1, wherein said heating means is a coil.

7. The apparatus, according to claim 6, wherein said coil is electrically operable.

8. The apparatus, according to claim 1, wherein said powered blower means includes one of an electric motor and an internal combustion engine.

9. The apparatus, according to claim 1, wherein said powered blower means includes an electric motor operable from a source of electrical power.

10. The apparatus, according to claim 9, wherein said source of electrical power is one of an electrical cord coupled to an electrical outlet and a battery disposed within said housing.

11. The apparatus, according to claim 10, wherein said battery is one of replaceable and rechargeable.

12. The apparatus, according to claim 9, wherein said source of electrical power is a rechargeable battery disposed within said housing and said apparatus further includes means for recharging said rechargeable battery from an electrical outlet.

13. The apparatus, according to claim 9, wherein said apparatus further includes a control means disposed in a predetermined location within one of said housing and said handle means for selectively activating and deactivating said powered blower means.

14. The apparatus, according to claim 13, wherein said control means is an electrical switch means.

15. The apparatus, according to claim 1, wherein said apparatus further includes a second handle means pivotally connected to said housing.

16. The apparatus, according to claim 15, wherein said apparatus further includes one of a strap and harness for suspending said apparatus from a portion of a human body.

17. The apparatus, according to claim 1, wherein said apparatus further includes a carrying and storage case.

18. A method for removal of at least one of snow and ice from a surface, said method comprising the steps of:
   (a) providing a portable apparatus capable of generating heated air flow;
   (b) activating said apparatus to generate said heated air flow;
   (c) positioning a discharge end of said apparatus towards a predetermined portion of said surface containing said at least one of snow and ice; and
   (d) applying said heated air flow generated in step (b) and exhausted from said discharge end of said housing onto said predetermined portion of said surface containing said at least one of snow and ice.

19. The method, according to claim 18, wherein said method further includes a step of maintaining application of said heated air flow applied in step (d) onto said predetermined portion of said surface until said at least one of snow and ice is substantially removed therefrom.

20. An apparatus for removal of at least one of snow and ice from a surface, said apparatus comprising:
   (a) a housing having a predetermined shape, at least one intake port and a discharge port;
   (b) a handle means engageable with said housing for carrying and operating said apparatus for removal of said at least one of snow and ice;
   (c) an electrically operable heating coil operably mounted adjacent said discharge port;
   (d) an electrically operable powered blower means disposed within said housing for drawing air through said at least one intake port and exhausting said air through at least a portion of said heating means and through said discharge port, whereby said exhausted air is heated by said heating means;
   (e) a nozzle having each of a predetermined size and a predetermined shape, said nozzle operably engageable with said housing adjacent said discharge port for applying said exhausted heated air under pressure onto said at least one of snow and ice for removal of said at least one of snow and ice from said surface; and
   (f) a control switch disposed in a predetermined location within one of said housing and said handle means for selectively activating and deactivating said powered blower means.