

[54] **TOOL HANDLE CONSTRUCTION**

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[*] Notice: The portion of the term of this patent subsequent to July 15, 1983, has been disclaimed.

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[52] U.S. Cl. **294/57, 306/24**

[51] Int. Cl. **B25g 3/26**

[58] Field of Search **294/57; 24/73.8 P; 16/110; 306/24**

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[57] **ABSTRACT**

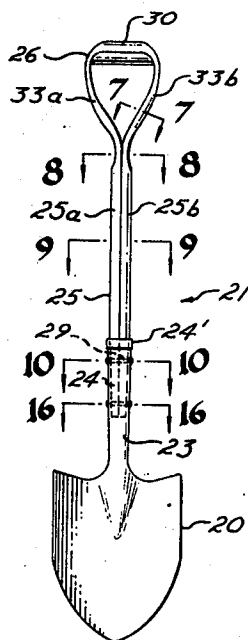
There is disclosed herein a shovel comprising a blade portion having a handle receiving socket, a handle portion made of a single length of tubing having its central portion formed into a gripping portion and the remainder thereof brought together and disposed in parallel, side-by-side relation to provide a shank portion inserted within the socket, and a plastic insert carried by the gripping portion.

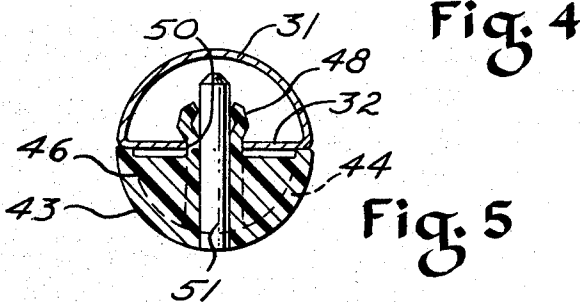
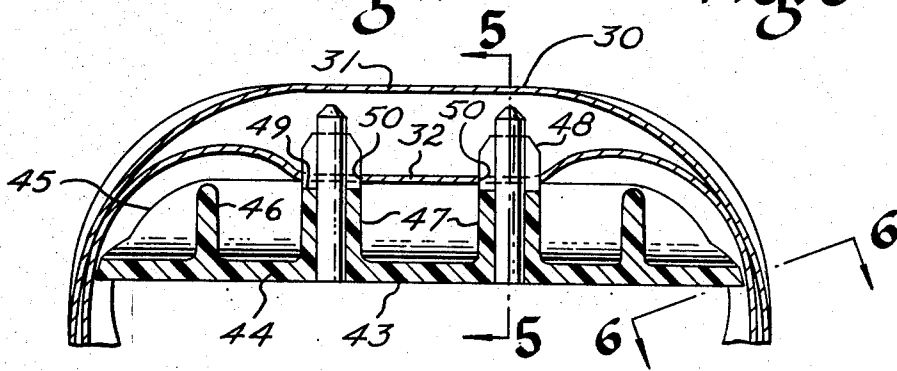
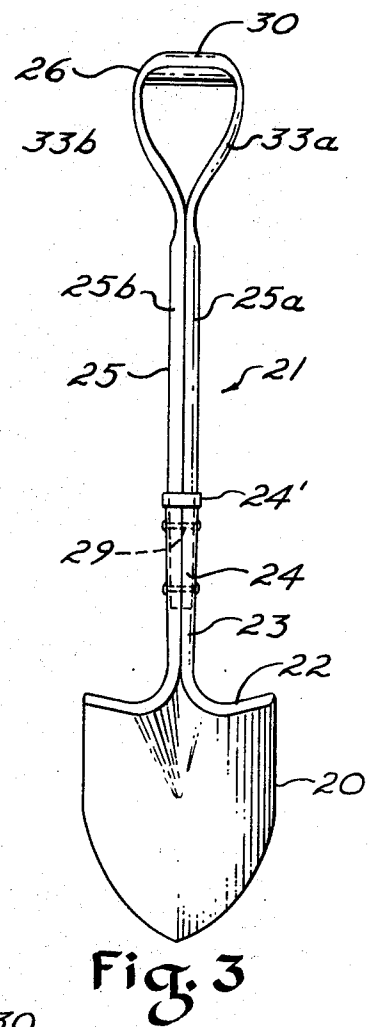
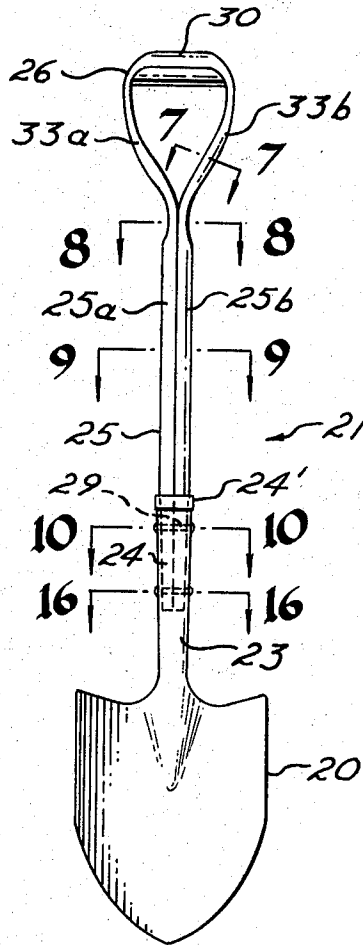
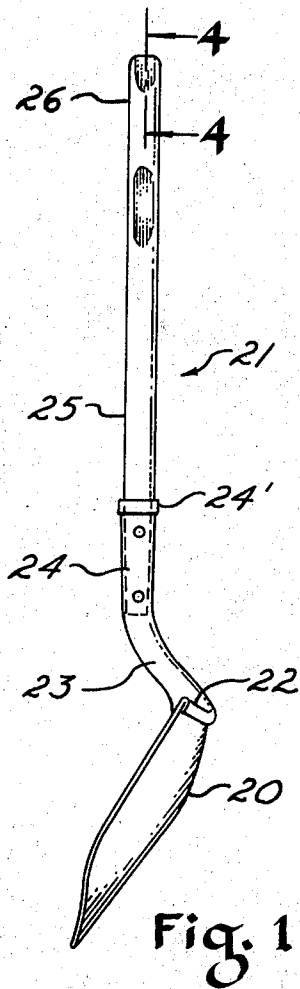
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14 Claims, 16 Drawing Figures





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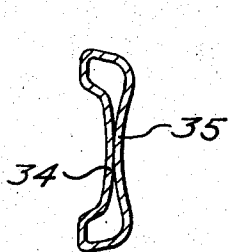


Fig. 6

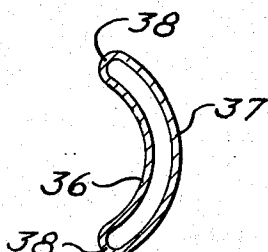


Fig. 7

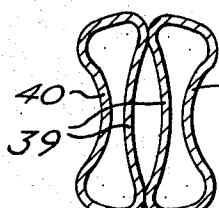


Fig. 8

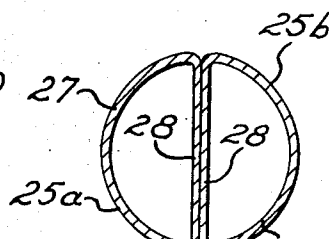


Fig. 9

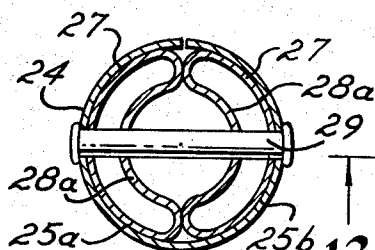


Fig. 10

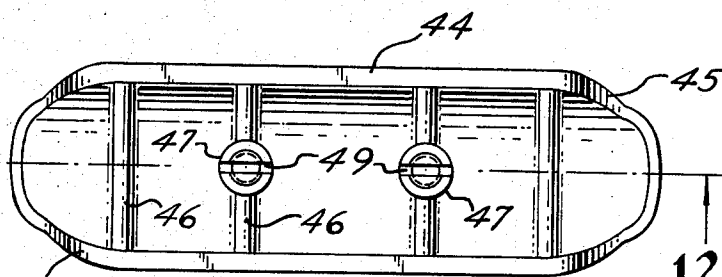


Fig. 11

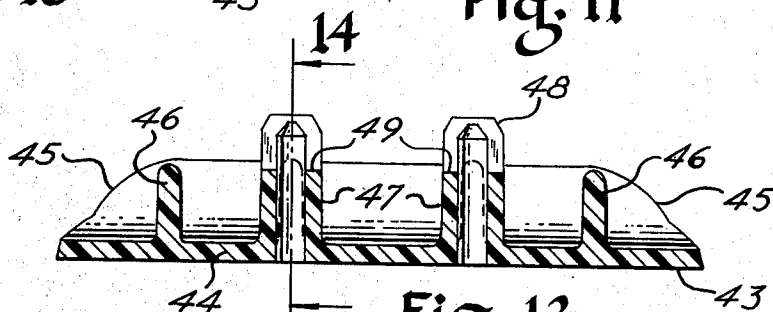


Fig. 12

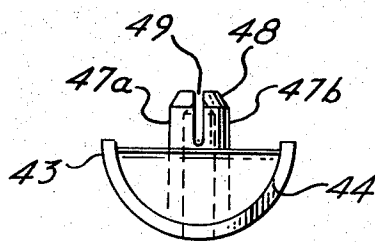


Fig. 13

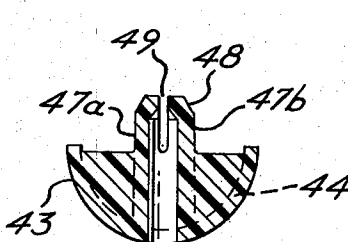


Fig. 14

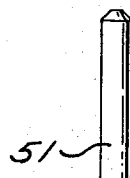


Fig. 15

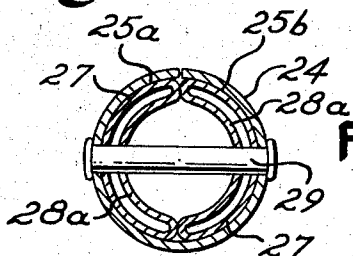


Fig. 16

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TOOL HANDLE CONSTRUCTION

This invention relates to hand tools and more particularly relates to a tool handle construction wherein the work engaging portion of the tool is provided with a handle receiving socket. The handle of the present invention is formed of a single piece of metal tubing symmetrically folded back on itself and having portions of semicircular cross section whereby when they are brought together in side-by-side relation they form a circular shank for insertion into the socket. The central portion of the piece of tubing is formed into a D-handle having a handhold or grip, a portion of which comprises a separate insert member.

The primary object of this invention is to provide an improved tool and tool handle construction which is light in weight, provided with a shank of extreme strength, and which is virtually indestructible in ordinary use.

Another object of the invention is to provide a tool handle construction wherein the grip and shank portions of the handle are integral and nonseparable.

Still another object of the invention is to provide a tool handle construction wherein the handle and grip portions are formed from a single length of metal tubing shaped to provide both the gripping and shank portions of the handle.

Yet another object of the invention is to provide a tool handle construction as set forth above wherein the grip portion of the handle is provided with a separate insert member for providing a more comfortable handhold or grip at the upper end of the tool.

A still further object is to provide an insert member for the gripping portion of the handle which is quickly and easily attached to the gripping portion and adds substantially to the comfortable use and attractive appearance of the tool.

Other objects of the invention and the invention itself will become readily apparent from the following description of the invention and the accompanying drawings, in which said drawings:

FIG. 1 is a side elevation of a shovel and handle construction embodying the present invention;

FIG. 2 is a front elevation of the shovel of FIG. 1;

FIG. 3 is a rear elevation of said shovel;

FIG. 4 is an enlarged detail in section taken along the line 4—4 of FIG. 1;

FIG. 5 is a transverse section taken along the line 5—5 of FIG. 4;

FIG. 6 is a transverse section taken along the line 6—6 of FIG. 4;

FIG. 7 is a transverse section taken along line 7—7 of FIG. 2;

FIG. 8 is a transverse section taken along the line 8—8 of FIG. 2;

FIG. 9 is a transverse section taken along the line 9—9 of FIG. 2;

FIG. 10 is a transverse section taken along the line 10—10 of FIG. 2;

FIG. 11 is a top plan view of an insert member of the gripping portion;

FIG. 12 is a longitudinal section taken along the line 12—12 of FIG. 11;

FIG. 13 is an end view of the insert member of FIG. 11;

FIG. 14 is a transverse section taken along the line 14—14 of FIG. 12;

FIG. 15 is an elevational view of a pin used in mounting the insert member of FIG. 11 to the grip portion of the shovel handle; and

FIG. 16 is a transverse section taken along the line 16—16 of FIG. 2.

Referring now to the drawings in all of which like parts are designated by like reference numerals, a preferred embodiment of the present invention is herein disclosed and illustrated in the form of a shovel having a blade 20 and a handle portion generally indicated at 21. In the form shown, the blade 20 has its upper edges folded backwardly and downwardly as indicated at 22, the folds being disposed on either side of a central, integrally formed forwardly angled extension 23 having an upwardly projecting socket 24. The extension and socket are integral with the blade 20, the metal thereof being rolled rearwardly and the edges being brought together to form the socket 24. The upper end of said socket is preferably provided with a reinforcing and decorative ferrule 24'.

The handle portion 21 comprises an elongated shank portion 25 and an uppermost D-handle 26. Said handle portion 21 is formed from a single piece of tubular metal formed centrally to provide the D-handle 26 and having its lateral portions 25a and 25b brought together in side-by-side, parallel relation to provide the shank 25.

As shown in FIG. 9, the upper portions of the lateral portions 25a and 25b are semicircular in cross section having outer convex wall portions 27 and inner, flat wall portions 28. When the flat wall portions 28 are disposed in flatwise contact, the portions 25a and 25b effectively provide a substantially circular shank for the handle 21.

FIGS. 10 and 16 illustrate the cross-sectional shapes of distal end portions of the lateral portions 25a and 25b which comprise the lower end portion of the shank 25. The flat wall portions 28 are progressively concavely formed in the downward direction to provide inner concave wall portions 28a disposed within the outer convex wall portions 27. This structure provides double outwardly curved walls in the portion of the shank which enters the socket 24 thereby providing great strength in the part of the handle portion 21 which is secured to the blade 20.

As herein disclosed, the socket 24 is preferably of slightly decreasing cross-sectional dimension in a downward direction whereby the lower end of the shank 25 comprising distal end portions of the lateral portions 25a and 25b can be driven tightly and firmly into said socket. As best seen in FIGS. 10 and 16, the shank 25 is secured within the socket 23 by means of transverse rivets 29 which extend through the wall of the socket and the wall portions 27 and 28a.

In forming the D-handle 26 of the handle portion 21, the tubing is provided with varying cross-sectional shapes adapted to maintain a high degree of structural strength while at the same time affording a comfortable and attractive gripping portion. The central portion of the piece of tubing provides a handgrip 30 which is semicircular in cross section comprising a convex outer wall portion 31 and a flat inner wall portion 32, as best seen in FIG. 5. At either end of the grip 30, the tubing is substantially flattened and bent downwardly transverse to the axis of said grip to provide downwardly converging arms 33a and 33b which converge at their lower

ends to form the D-handle 26. At the bends adjacent to the ends of the grip 30 the tubing has the general form shown in FIG. 6 and comprises inner and outer concave wall portions 34 and 35, respectively. The arms 33a and 33b have the transverse shape shown in FIG. 7 comprising concave inner wall portions 36 and convex outer wall portions 37 spaced from each other and joined along their edges by rounded portions 38. In the area of convergence of the arms 33a and 33b, the tubing is again substantially flattened and comprises inner and outer concave wall portions 39 and 40, respectively, as shown in FIG. 8. The shank 25 extends downwardly from the converging lower ends of the arms 33a and 33b.

Referring now particularly to FIGS. 4, 5, and 11-15, the semicircular grip 30 is provided with a grip insert 43 at its lower side adjacent to the flat wall portion 32. As herein disclosed, said insert is preferably made of a suitable plastic molded to provide a downwardly convex, semicircular wall 44 having end edges 45 curved to interfit the curved tubing at the upper ends of the arms 33a and 33b. Integral transverse ribs 46 preferably reinforce the wall 44 on its upper, concave side.

The insert 43 is also provided with a pair of integrally formed, upwardly directed tubular extensions 47 the upper end portions of which are restricted by inward tapers 48 and which are provided with axially directed slots 49 which extend downwardly a substantial distance. The tubular extensions 47 are preferably integrally formed with a pair of the ribs 46, and the slots 49 effectively divide the upper ends thereof into separate extension portions as indicated at 47a and 47b in FIGS. 13 and 14.

The grip insert 43 is secured to the grip 10 by inserting the tubular extensions 47 upwardly through a pair of apertures 50 in the flat wall portion 32 as best seen in FIGS. 4 and 5. A pin 51 is then driven upwardly into each said tubular extension, said pins being of such length as to project upwardly above the upper ends of said extensions when their lower ends are flush with the outer convex surface of the semicircular wall 44. As shown in FIG. 5, each pin 51 when driven in place causes a restricting tapered portion 48 to be deformed laterally due to the fact that said pin is larger than the distance between the portions 47a and 47b at said tapered portion. The lateral expansion of the upper end portion of said tubular extensions takes place within the grip 30 and above the flat wall portion 32 whereby the insert 43 is securely locked to the grip.

From the foregoing, it will be seen that the present invention provides a tool handle construction having the gripping portion thereof integral with the shank portion whereby it can not become loose or detached in use. The hollow tubular construction of the handle portion provides a light weight, easily handled tool of great strength. Since both the handle and the socket 24 of the blade 20 are made of metal, the compressive reactive press fit therebetween will not loosen due to deterioration of the handle such as frequently happens in the use of wooden handles. By means of the insert 43, the horizontal grip 30 provides a round, smooth, manual gripping surface for the hand of the user which cannot become loosened or dislodged in use.

It will be understood that many changes in the details of the invention as herein described and illustrated may

be made without, however, departing from the spirit thereof or the scope of the appended claims.

What is claimed is:

1. A tool handle construction comprising a single piece of tubing, the central portion of said tubing providing a handgrip; portions of said tubing adjacent to the ends of said handgrip being bent transverse to the axis of said handgrip and comprising converging arms therebelow to form a D-handle; said tubing formed to provide inner and outer concave wall portions in the area of convergence of said arms and at the bends of said arms adjacent to said handgrip; portions of said tubing below said area of convergence of said arms being disposed side-by-side and parallel to form a shank for connecting to the work engaging portion of a tool; and said portions of said tubing forming the shank being semicircular in transverse section having flat wall portions disposed adjacent to each other and convex wall portions which together form a substantially circular shank.

2. A tool handle construction comprising a single piece of tubing, the central portion of said tubing providing a handgrip; portions of said tubing adjacent to the ends of said handgrip being bent transverse to the axis of said handgrip and comprising converging arms therebelow to form a D-handle; portions of said tubing below said D-handle being disposed side-by-side and parallel to form a shank for connecting to the work engaging portion of a tool; said handgrip being semicircular in transverse section and having a flat inner wall portion and a convexly rounded outer wall portion; and an insert member secured to the flat side of said handgrip and complementing said outer wall portion of said handgrip.

3. A tool handle construction comprising a single piece of tubing, the central portion of said tubing providing a handgrip; portions said aid tubing adjacent to the ends of said handgrip being bent transverse to the axis of said handgrip and comprising converging arms therebelow to form a D-handle; portions of said tubing below said D-handle being disposed side-by-side and parallel to form a shank for connecting to the work engaging portion of a tool; said handgrip being semicircular in transverse section and having a flat inner wall portion and a convexly rounded outer wall portion; and an insert member having a downwardly convex outer wall surface secured to the flat side of said handgrip and complementing said outer wall portion of said handgrip whereby said handgrip is substantially circular in cross section.

4. A tool handle construction comprising a single piece of tubing, the central portion of said tubing providing a handgrip; portions of said tubing adjacent to the ends of said handgrip being bent transverse to the axis of said handgrip and comprising converging arms therebelow to form a D-handle; portions of said tubing below said D-handle being disposed side-by-side and parallel to form a shank for connecting to the work engaging portion of a tool, said handgrip being semicircular in transverse section and having a flat inner wall portion and a convexly rounded outer wall portion; an insert member secured to the flat side of said handgrip and complementing said outer wall portion of said handgrip; said insert member comprising a downwardly convex wall and at least one integral tubular extension

projecting in the direction of said flat inner wall; the distal end of said tubular extension having a restricted portion; said inner wall having at least one aperture therein; said extension projecting through said aperture, the projecting portion being slotted along the axis thereof; and a pin projecting through said tubular extension and laterally expanding said restricted portion to enlarge said distal end and secure said insert to said grip.

5. A tool and handle construction comprising a work engaging portion having a handle receiving socket; a single elongated piece of metal tubing, the central portion of said tubing providing a handle grip; portions of said tubing adjacent to the ends of said grip being substantially flattened and bent transverse to the axis of said grip to provide converging arms forming a D-handle, the bent portions of said tubing immediately adjacent to said grip having inner and outer concave wall portions, the medial portions of said arms having inner concave and outer convex wall portions, and the portions of said arms adjacent to their point of convergence having inner and outer concave wall portions; said tubing having portions of semicircular cross section disposed side-by-side and parallel beyond said D-handle to provide a substantially circular shank portion; the distal end portion of said shank portion being telescoped into said socket and secured thereto; said grip having an outer convex wall portion and a flat wall portion disposed inwardly of said D-handle; a plastic insert member mounted to said flat wall portion of said grip; said insert member having a convex wall complementing said outer wall portion of said grip and a pair of tubular extensions projecting inwardly of said convex wall; said tubular extensions having through-bores extending through said convex wall of said insert; means restricting said through-bores at their inner ends; the inner ends of said extensions being slotted along the axes of said extensions and projecting through apertures provided in the flat wall portion of said grip; and pins forcefitted into said through-bores and extending at least the length of said extensions, said pins laterally expanding the restricted portions of said extensions within the tubular grip whereby said insert member is secured to said grip.

6. In a tool handle construction, a grip having a flat wall portion and means providing a portion only of a manual gripping surface; an insert member for attaching to said flat wall surface and having a complementary wall providing the remainder of said gripping surface; said insert having at least one tubular extension; said flat wall portion having at least one aperture therein, said extension having a distal end portion projecting through said aperture; said extension having a through-bore extending through the wall of said insert; means restricting said through-bore at said distal end portion; said distal end portion being slotted along the axis thereof; and a pin pressed into said through-bore and expanding the restricted distal end portion of said extension whereby said insert member is secured to said grip.

7. In a tool handle construction, a tubular grip having a flat wall portion and means providing a portion only of a manual gripping surface; an insert member for attaching to said flat wall surface and having a complementary wall providing the remainder of said gripping

surface; said insert having at least one tubular extension; said flat wall portion having at least one aperture therein, said extension having a distal end portion projecting through said aperture; said extension having a through-bore extending through the wall of said insert; means restricting said through-bore at said distal end portion; said distal end portion being slotted along the axis thereof; a pin pressed into said through-bore and expanding the restricted distal end portion of said extension whereby said insert member is secured to said grip; said grip being provided with a convex wall complementary to said first mentioned complementary wall and comprising said portion of a manual gripping surface.

8. A tool and handle construction comprising a work engaging portion having a handle receiving tubular socket; a handle formed from a single elongated piece of metal tubing, the central portion of said tubing providing a handgrip; portions of said tubing adjacent to the ends of said grip being bent transverse to the axis of said grip to provide converging arms forming a D-handle; said tubing having lateral portions of semicircular cross section disposed side-by-side and parallel beyond said D-handle including flat wall portions disposed adjacent to each other and convex wall portions to provide a substantially circular shank portion; the distal end portion of said shank portion being telescoped into said socket and secured thereto; the bend portions of tubing immediately adjacent to said grip are substantially flattened providing inner and outer concave wall portions, and portions of said arms adjacent to their point of convergence having inner and outer concave wall portions.

9. A handle construction for work tools, comprising: a handgrip portion; a pair of spaced tubular arms disposed transverse to said handgrip portion and having said handgrip portion interposed and secured therebetween; said tubular arms disposed downwardly and having converging portions extending into tubular lateral portions; said lateral portions disposed side-by-side and parallel forming a shank portion of the handle; and said shank having a distal end portion adapted to engage a work portion of the work tool, wherein the tool spaced portions of said tubular arms include concave inner wall portions.

10. The handle construction of claim 9 wherein the converging portions of said tubular arms include outer concave wall portions.

11. A handle construction for work tools, comprising: a handgrip portion, a pair of spaced tubular arms disposed transverse to said handgrip portion and having said handgrip portion interposed and secured therebetween; said tubular arms disposed downwardly and having converging portions extending into tubular lateral portions; said lateral portions disposed side-by-side and parallel forming a shank portion of the handle; and said shank having a distal end portion adapted to engage a work portion of the work tool, wherein each tubular lateral portion is substantially semicircular in cross section having outer convex wall portions and inner flat wall portions, and said flat wall portions in contact to provide a substantially circular shank portion, wherein said inner wall portions include concave inner wall portions at the distal end portion of the shank.

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12. A tool handle construction, comprising: a handgrip; spaced tubular arms having said handgrip interposed therebetween integral therewith and having integral bend portions; said bend portions having inner and outer concave wall portions; said spaced arms extending downwardly and converging forming convergent portions; said convergent portions of said arms extending into tubular lateral portions disposed parallel and side-by-side forming a shank portion of the handle; said shank portion adapted to be secured to a work engaging portion of the tool.

13. The handle construction of claim 12 wherein the spaced tubular arms include concave inner wall portions and the converging portion of said tubular arms having outer concave wall portions.

14. The handle construction of claim 13 wherein each tubular lateral portion has a substantially semi-circular cross section having outer convex wall portions and inner flat wall portions, the distal end portions of the tubular lateral portions having inner concave wall portions.

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