



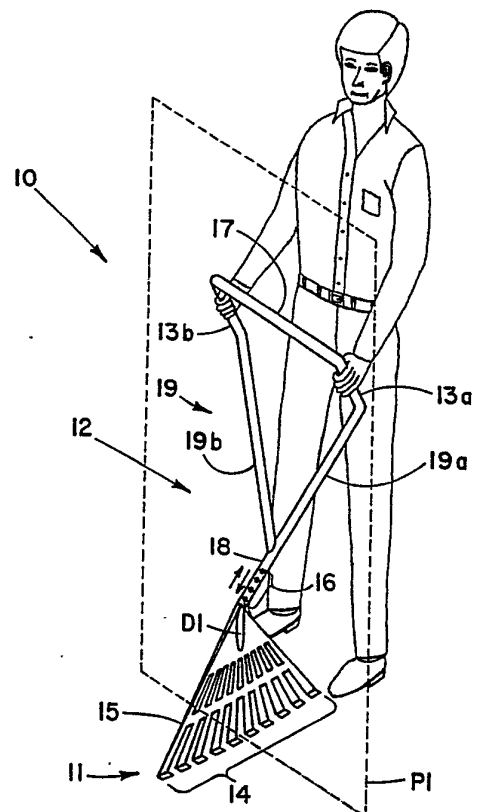
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁵ : B25G 1/00</p>	<p>A1</p>	<p>(11) International Publication Number: WO 91/06401 (43) International Publication Date: 16 May 1991 (16.05.91)</p>
<p>(21) International Application Number: PCT/US90/06140 (22) International Filing Date: 23 October 1990 (23.10.90) (30) Priority data: 426,098 24 October 1989 (24.10.89) US (71)(72) Applicant and Inventor: KEGLEY, Boyd, F. [US/US]; 8402 Catamaran Drive, Indianapolis, IN 46236 (US). (74) Agents: McNETT, John, C. et al.; Woodard, Emhardt, Naughton, Moriarty & McNett, Bank One Center/Tow- er, 111 Monument Circle, Suite 3700, Indianapolis, IN 46204-5137 (US).</p>		<p>(81) Designated States: AT (European patent), AU, BB, BE (European patent), BF (OAPI patent), BG, BJ (OAPI patent), BR, CA, CF (OAPI patent), CG (OAPI patent), CH (European patent), CM (OAPI patent), DE (European patent), DK (European patent), ES (European patent), FI, FR (European patent), GA (OAPI patent), GB (European patent), GR (European patent), HU, IT (European patent), JP, KP, KR, LK, LU (European patent), MC, MG, ML (OAPI patent), MR (OAPI patent), MW, NL (European patent), NO, RO, SD, SE (European patent), SN (OAPI patent), SU, TD (OAPI patent), TG (OAPI patent).</p> <p>Published <i>With international search report.</i></p>

(54) Title: A HANDLE AND IMPLEMENT HEAD ASSEMBLY

(57) Abstract

A handle and implement head assembly (10) comprising an implement head (11) having a working edge (14) adjacent a substantially planar portion (15). The assembly further includes a pair of generally longitudinal gripping portions (13) having parallel axes and a connection member (12) that positions the pair of gripping portions on the same side of and substantially equidistant from a central plane which perpendicularly intersects the center of the working edge. At least one of the gripping portions would be positioned outside the plane of the implement.



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A HANDLE AND IMPLEMENT HEAD ASSEMBLY

BACKGROUND OF THE INVENTION

This invention relates to handle constructions which may be used for rakes, brooms and the like.

- 5 Numerous handle constructions have been designed for use with rake heads, broom heads and similar implement heads. However, prior art handle constructions tended not to take advantage of conveniently positioning the gripping portions of the handle relative to the implement head and the user.
- 10 By not advantageously adapting the handle construction to the human body for the task to be performed, many advantages such as reduced effort and stress on the user have not been realized in the past.

SUMMARY OF THE INVENTION

One embodiment of the present invention might involve a handle and implement head assembly which comprises an implement head having a working edge adjacent a substantially planar portion. The assembly would further include a pair of generally longitudinal gripping portions having parallel axes and a connection member for positioning the pair of gripping portions on the same side of and substantially equidistant from a central plane perpendicularly intersecting the center of the working edge. At least one of the gripping portions would be positioned outside an implement plane which is coplanar with the substantially planar portion.

One object of the invention is to provide an improved handle and implement assembly.

Still another object of the invention is to provide a handle and implement head assembly that reduces the user's physical stress and effort encountered during the task of using the implement.

A further object of the invention is to provide a handle and implement head assembly that reduces the amount of effort needed to use the implement, and thereby reduces the stress on the user's back, shoulders, arms, elbows, wrists, hands, and fingers involved.

Yet another object of the invention is to provide a handle and implement head assembly which has gripping members positioned relative to the implement head and user so as to allow the user's hands and body to assume an enhanced position and consequently impart force to the implement head during the user's normal forward stroke in a more efficient manner.

Other objects and benefits of the present invention can be discerned from the following written description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the handle and implement head assembly of the present invention in its unextended mode.

FIG. 2 is a front elevational view of the handle and
5 implement assembly of FIG. 1.

FIG. 3 is a side elevational view of the handle and implement assembly of FIG. 1.

FIG. 4 is a top elevational view of the handle and implement assembly of FIG. 1.

10 FIG. 5 is a cross sectional view of a portion of the lower connection portion of the handle and implement assembly of FIG. 1, in its extended mode, showing the detail of the extension latch mechanism.

DESCRIPTION OF THE PREFERRED EMBODIMENT

For the purposes of promoting an understanding of the principles of the invention, reference will now be made to the embodiments illustrated in the drawings and specific
5 language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended, such alterations and further modifications in the illustrated device, and such further applications of the principles of the invention as
10 illustrated therein being contemplated as would normally occur to one skilled in the art to which the invention relates.

Referring now to FIGS. 1, 2, 3 and 4 there is illustrated a handle and implement head assembly 10. The assembly 10
15 comprises in general an implement head 11, a connection member 12 and a pair of generally longitudinally shaped gripping portions 13. Gripping portions 13 include a first gripping portion 13a and a second gripping portion 13b.

It should be pointed out that while this invention
20 depicts the use of the handle portion employed in conjunction with a rake head, the handle unit may be used in combination with a variety of other implement heads such as brooms and the like.

Connection member 12 is positioned substantially upright
25 and includes a lower connection portion 18 and upper connection portion 19. Upper connection portion 19 includes a first upper connection portion 19a and a second upper connection portion 19b. Lower connection portion 18 includes and is secured to implement head 11 by a readily adjustable
30 securing means 16. Securing means 16 may be used with the invention to readily adjust the distance between the implement head 11 and gripping portions 13. Providing such a securing means allows the user to adjust the gripping portions to a vertical height with which the user would feel
35 most comfortable. As illustrated in FIG. 5, securing means

16 used in the preferred embodiment includes a number of serially aligned apertures 16a -16d in an outer tubular member 18b, and a cooperating readily retractable protruding member 26 which is spring biased into position by leaf spring 5 27 fixed to the inside of inner tubular member 18a. By depressing the protruding member 26, the outer tubular member 18b can slide to an alternative position with respect to the inner tubular member 18a, and resiliently lock into place. Other suitable readily adjustable securing means are known in 10 the art and may alternatively be used with the invention to readily adjust the distance between the implement head 11 and gripping portions 13. The tubular members 18a and 18b may be keyed to prevent rotation.

At its upper ends, first and second upper connection 15 portions 19a and 19b are attached to first and second gripping portions 13a and 13b respectively. The gripping portions are about 17 inches apart. Preferably such gripping portions are from about 13 to about 21 inches 20 apart. Such members are attached by being continuously cast together, however, other suitable attaching means such as screws, rivets or the like may be used. Gripping portions 13a and 13b may be maintained at a distance apart of about 40% of the distance from a working edge 14 to gripping 25 portion 13a. A cross member 17 is fixedly positioned between gripping members 13a and 13b. Cross member 17 is attached to gripping portions 13 by being continuously cast together, however, other suitable attaching means such as those earlier mentioned may be used. Cross member 17 provides stability to 30 well as enhancing safety by avoiding protruding gripping member ends.

At its lower ends, first and second upper connection portions 19a and 19b are attached to lower connection portion 18. All three members are preferably made of a continuous 35 tubular material beginning at portion 18b, and continuing

through portion 19a, gripping portion 13a, cross member 17, gripping portion 13b, and portion 19b, where it terminates at the junction of portion 18b and 19a.

Implement head 11 is a rake head which includes 22
5 flexible tines 22a-22v (fewer are shown in the drawings for clarity of illustration), which terminate at a working edge 14. The rake head is of a type conventionally used for raking leaves, although alternatively one can use an
10 increased size rake head in view of the increased effectiveness of the invention. Working edge 14 is adjacent to the substantially planar portion 15 of the implement head. A central plane P1 perpendicularly intersects the center of working edge 14 as shown in FIGS. 1, 2 and 4. Central plane P1 intersects the substantially planar portion
15 15 at dotted line D1 (see FIG. 1). Connection member 12 and gripping portions 13 are completely positioned on the same side of central plane P1. In addition, first and second gripping portions 13a and 13b respectively are positioned substantially the same distance away from central plane P1.
20 By positioning each of the gripping portions 13a and 13b on the same side of and substantially equidistant from center plane P1, the user is able to assume a more comfortable bodily position during the act of using the hand implement. Other ergonomic advantages of the above feature will be
25 discussed below.

An implement plane P2 is coplanar with substantially planar portion 15 as indicated in FIGS. 3 and 4. First gripping portion 13a is positioned in implement plane P2 while second gripping portion 13b is positioned outside
30 implement plane P2. By positioning at least one of the gripping members outside implement plane P2, the user is able to apply a significant torque to implement head 11 which greatly aids in the manipulation of the implement head during use of the hand implement.

35 In FIGS. 2 and 4, it can be seen that an end plane P3 is

parallel to central plane P1 and intersects one of the ends of working edge 14 at location E1. Gripping portions 13 are positioned, when compared to working edge 14, on the opposite side of end plane P3. With gripping portions 13 positioned
5 at the above convenient location, the user can comfortably reach the gripping portions during the act of using the hand implement. Further ergonomic advantage of the above feature will be discussed below.

As illustrated in FIG. 2, gripping portions 13 are
10 positioned such that each of the angles Θ_1 , defined by each of the gripping portions 13 relative to central plane P1, is about 45°. By positioning the gripping portions at an angle comfortable to the user, significant ergonomic advantages (discussed below) may be achieved. Preferrably angles Θ_1
15 are from 20° to 60°, and and more preferrably are from 35° to 50°.

By positioning of gripping members 13a and 13b at the location and orientation described in the foregoing paragraphs, the handle and implement head assembly 10 can be
20 advantageously adapted to the human body for the task to be performed. There exist significant ergonomic advantages associated with positioning gripping portions 13a and 13b in the most preferred fashion at (1) a comfortable vertical height relative to the user's body height, (2) a comfortable
25 distance apart relative to the user's body width, (3) equal distances from the center plane, (4) the opposite side of the end plane relative to the working edge, and (5) an angle defined by the gripping portions relative to the central plane that is about 45°. For instance, one of the
30 aforementioned advantages is that the human effort which is required to propel the implement head against the countervailing forces of stationary leaves or the like can be low while the speed of motion of the implement head is high. In other words, such arrangement of the gripping members
35 relative to the implement head and user would allow the

user's hands and body to assume an enhanced position and consequently impart force to the rake head during the forward stroke in a more efficient manner. Another advantage would be that such positioning of the gripping members would
5 significantly reduce the stress on the user's back, shoulders, arms, elbows, wrists, hands, and fingers during the task of raking or the like since the gripping members are positioned conveniently in front of the user and at an angle comfortable to the user and therefore stress on the user's
10 body is substantially reduced. On the contrary, a conventional implement such as a rake requires the user to grasp the implement at two relatively inconvenient positions with regard to location and angle thus resulting in undesirable stress on the user's back, shoulders, arms,
15 elbows, wrists, hands, and fingers.

While the invention has been illustrated and described in detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character, it being understood that only the preferred
20 embodiment has been shown and described and that all changes and modifications that come within the spirit of the invention are desired to be protected.

It is possible to make the handles symmetrical about the implement plane. With symmetry about the implement plane,
25 reversability for right handed and left handed alternatives can be readily achieved by adding a feature of pivoting of the implement head within the implement plane, with sufficient pivoting to place the handles equally distant from but on the opposite side of the central plane. Tines on the
30 rake head which alternatively are bent in opposite directions or which are split to extend simultaneously in two directions may be used to facilitate change between right hand and left hand usage. One could modify the device shown by replacing the gripping member with bicycle handlebars, and using a
35 single or double shaft to connect to the implement head. One

could modify the device shown by eliminating the adjustment
to the length to reduce cost and complexity. Alternatively,
adjustability as to the spacing between the gripping portions
could be added. The term "working edge" as used herein, in
5 intended to refer to that portion which in normal use
contacts the surface which is being worked by the implement.

What I claim is:

1. A handle and implement head assembly comprising:
an implement head having a working edge adjacent a
substantially planar portion;
5 a pair of generally longitudinal gripping portions having
axes parallel to each other;
a connection member positioning said pair of gripping
portions a fixed distance apart on the same side of and
substantially equidistant from a central plane
10 perpendicularly bisecting said planar portion and passing
through the center of the working edge, with at least one of
said gripping portions being completely outside all implement
planes which are coplanar with said substantially planar
portion.
- 15 2. The handle and implement head assembly of claim 1 in
which said connection member is configured to position at
least some part of said pair of gripping portions, when
compared to the working edge, on the opposite side of an end
plane which is parallel to said central plane and intersects
20 an end of said working edge.
3. The handle and implement head assembly of claim 1 in
which the connection member has means for readily adjusting
the distance between the implement head and said pair of
gripping portions.
- 25 4. The handle and implement head assembly of claim 1
wherein the axes of said gripping portions are each oriented
at an angle between about 20° and 60° relative to the central
plane.
5. The handle and implement head assembly of claim 4
30 wherein each of said angles is about 45°.

6. The handle and implement head assembly of claim 5 wherein said connection member has an upper portion which has first and second upper connection portions and includes a lower connection portion.

- 5 7. A handle and implement head assembly comprising:
an implement head having a working edge adjacent a substantially planar portion;
a pair of generally longitudinal gripping portions having axes parallel to each other;
- 10 a connection member positioning said pair of gripping portions a fixed distance apart and on the same side of and substantially equidistant from a central plane perpendicularly intersecting the center of the working edge, with at least one of said gripping portions being outside an
- 15 implement plane which is coplanar with said substantially planar portion;
wherein the axes of said gripping portions are each oriented at an angle between about 20° and 60° relative to the central plane;
- 20 wherein said connection member has an upper portion which has first and second upper connection portions and includes a lower connection portion; and
wherein said first upper connection portion is attached to one of said pair of gripping portions at a first end
- 25 thereof and said second upper connection portion is attached to the other of said pair of gripping portions at a first end thereof.

8. The handle and implement head assembly of claim 7 which additionally includes a cross member attaching between

30 the second ends of each of said pair of gripping portions.

9. The handle and implement head assembly of claim 8 in

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which said upper portion of said connection member, said pair of gripping portions, and said cross member are configured as a continuous tubular member.

10. The handle and implement head assembly of claim 1,
5 2, 3, 4, 5, 7, 8 or 9 wherein said implement head is selected from the group consisting of a rake head and a broom head.

11. The handle and implement head assembly of claim 10 in which said implement head is a rake having more than 12 flexible tines.

10 12. A handle and implement head assembly comprising:
an implement head having a working edge adjacent a substantially planar portion;
a pair of generally longitudinal gripping portions having axes which are noncollinear with each other;
15 a connection member positioning said pair of gripping portions on the same side of a central plane perpendicularly bisecting said planar portion and passing through the center of the working edge, with at least one of said gripping portions being, when compared to said implement head,
20 substantially on the opposite side of an edge plane which is parallel to the central plane and intersects an end of said working edge of said implement head, and in a position so that the axes of said gripping portions are each oriented at an angle between about 20° and 60° to the central plane.

25 13. The handle and implement head assembly of claim 12 in which said connection member is configured to position at least one of said pair of gripping portions outside of an implement plane coincident with the substantially planar portion of said implement head.

30 14. The handle and implement head assembly of claim 12

or 13 in which said implement head is a rake head having more than 12 flexible tines and said connection member is configured to position the axes of said gripping portions relative to the central plane between about 35° and 50°.

- 5 15. A handle and implement head assembly comprising:
 an implement head having a working edge adjacent a
 substantially planar portion;
 a pair of generally longitudinal gripping portions having
 axes which are noncollinear with each other;
- 10 a connection member positioning said pair of gripping
 portions so that substantially the entire portion of each of
 them is on the same side of a central plane perpendicularly
 bisecting said planar portion in passing through the center
 of the working edge, with each of said gripping portions
15 having a first end closer to the central plane than its
 corresponding second end, and with each of said first ends
 being further than its corresponding second ends from an edge
 line perpendicular to said central plane at its intersection
 with the center of the working edge.
- 20 16. The handle and implement head assembly of claim 15
 in which said pair of generally longitudinal gripping
 portions are about parallel to one another in orientation.
17. The handle and implement head assembly of claim 15
 or 16 in which said implement head is a rake having more than
25 12 flexible tines.

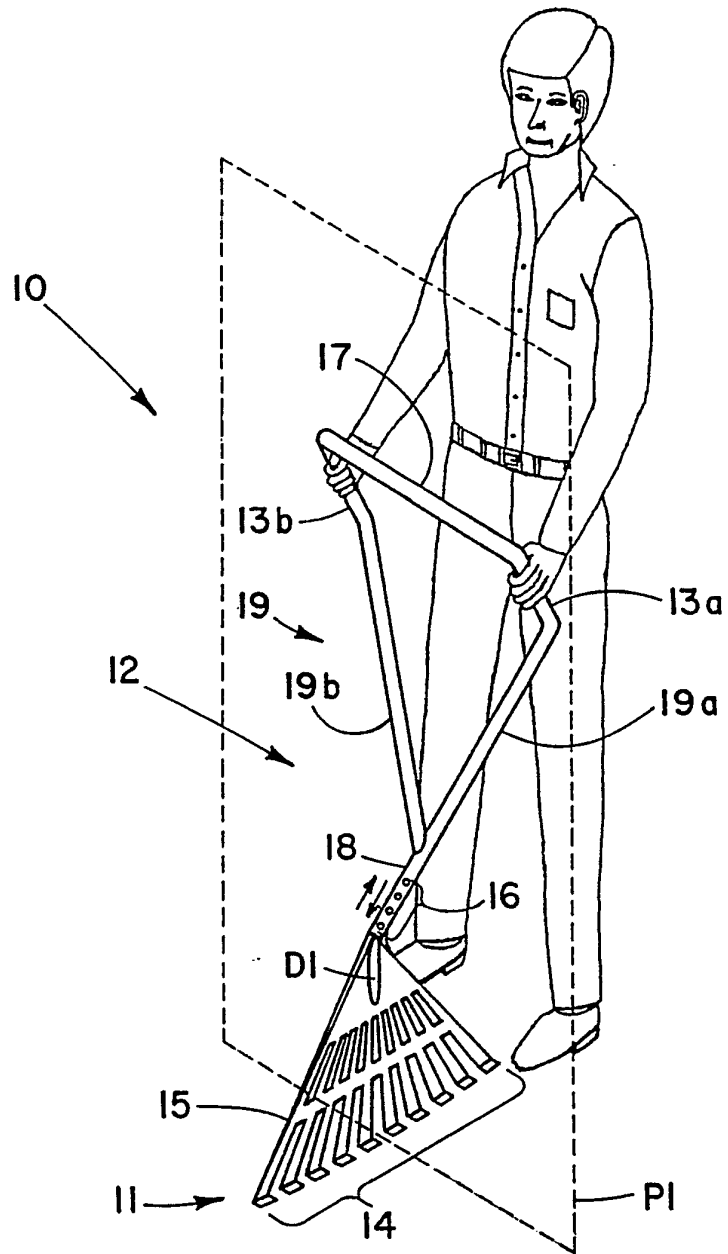


Fig.1

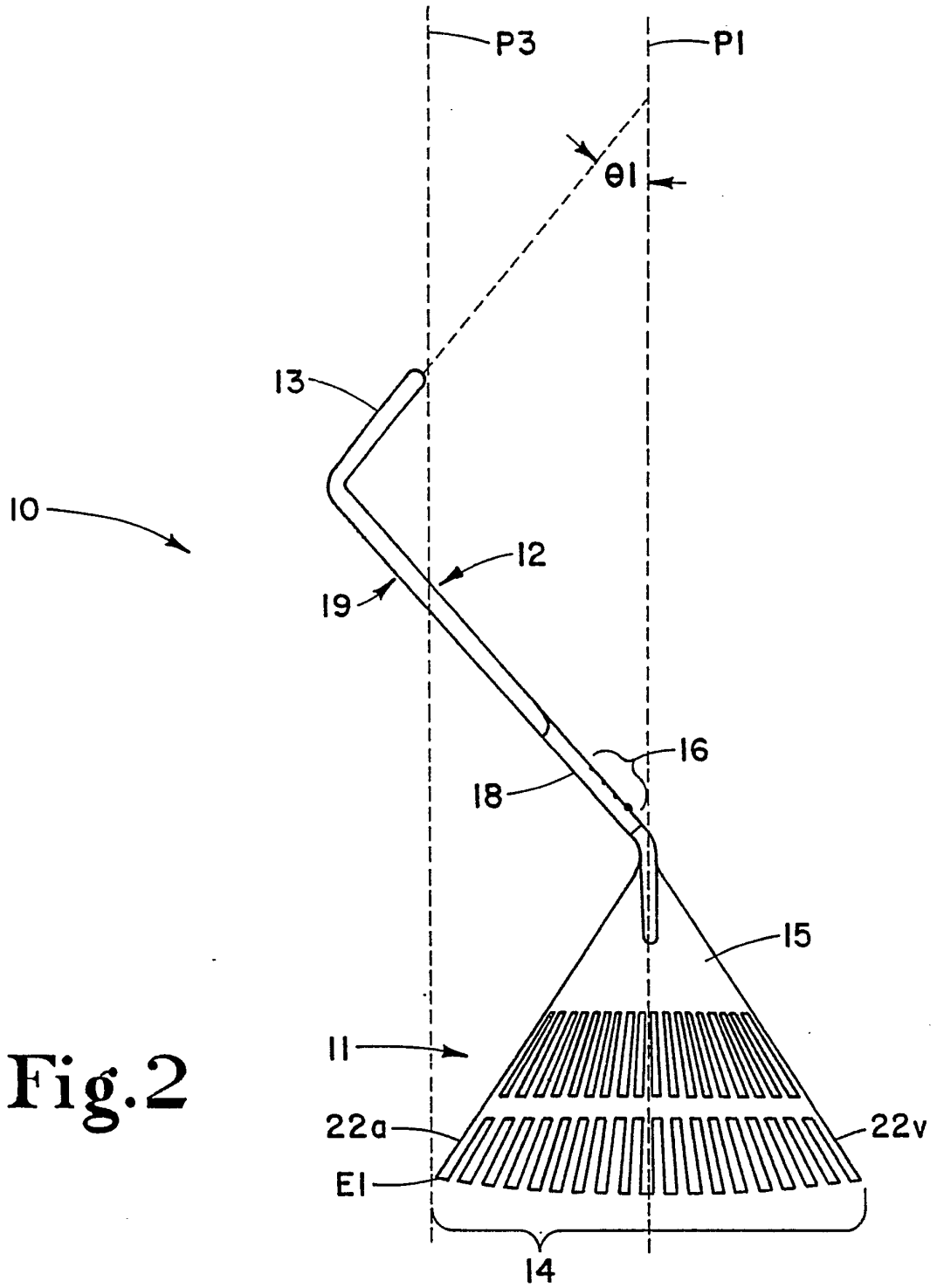


Fig.2

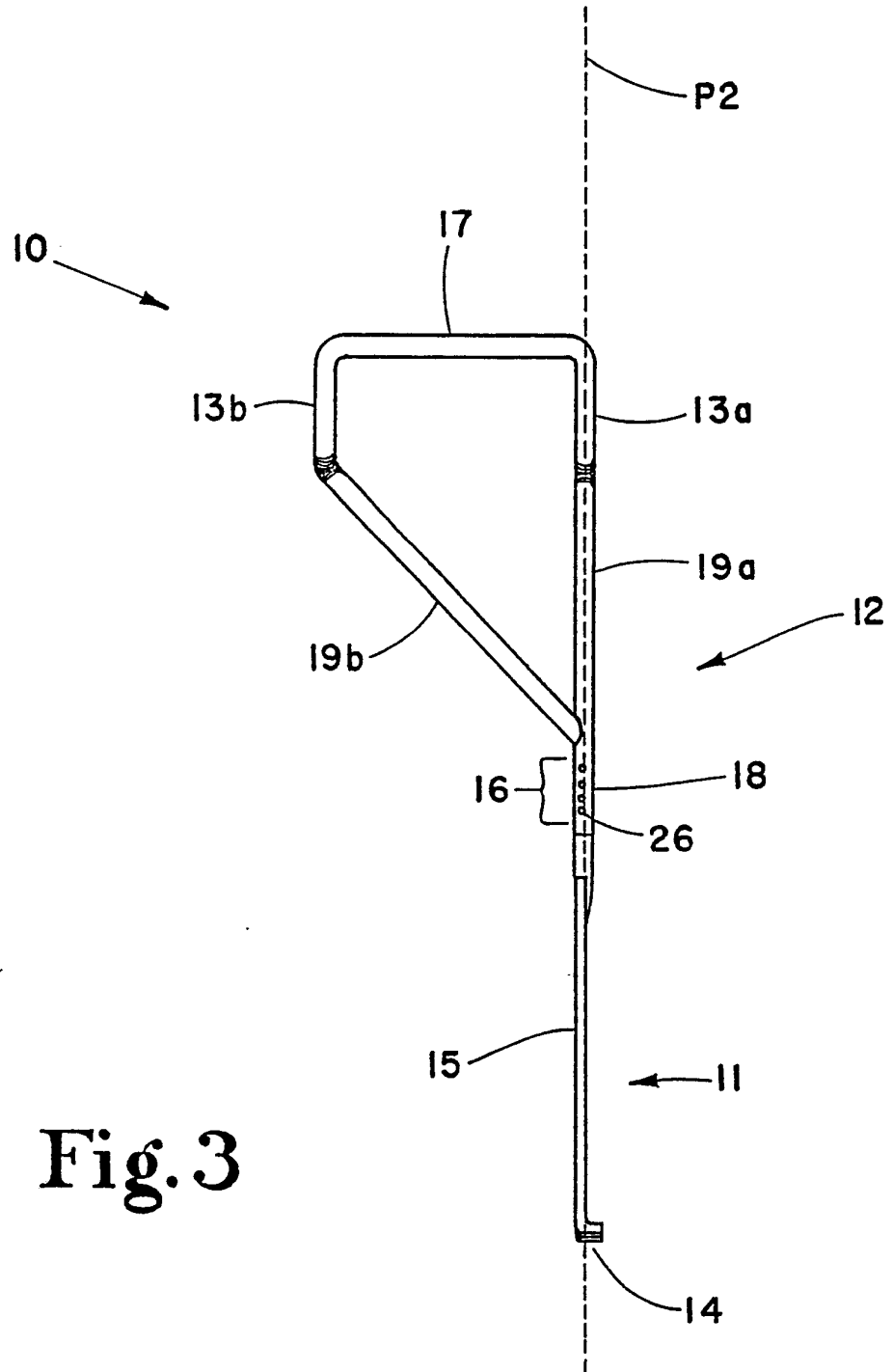


Fig. 3

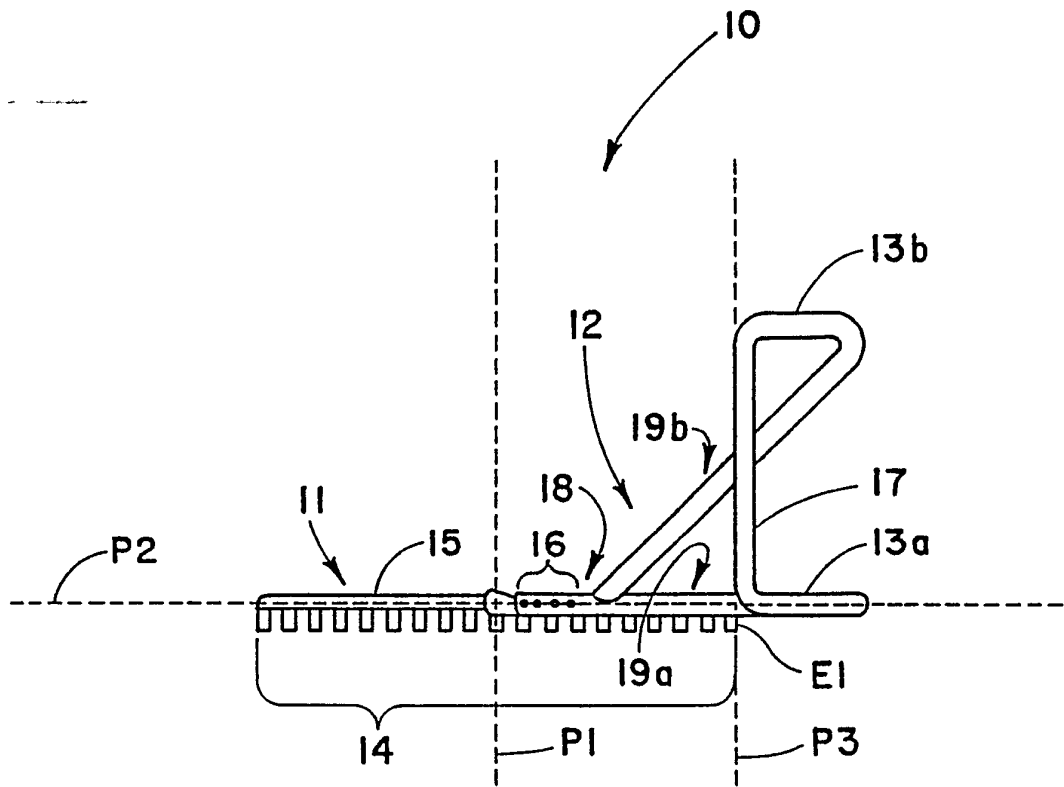


Fig. 4

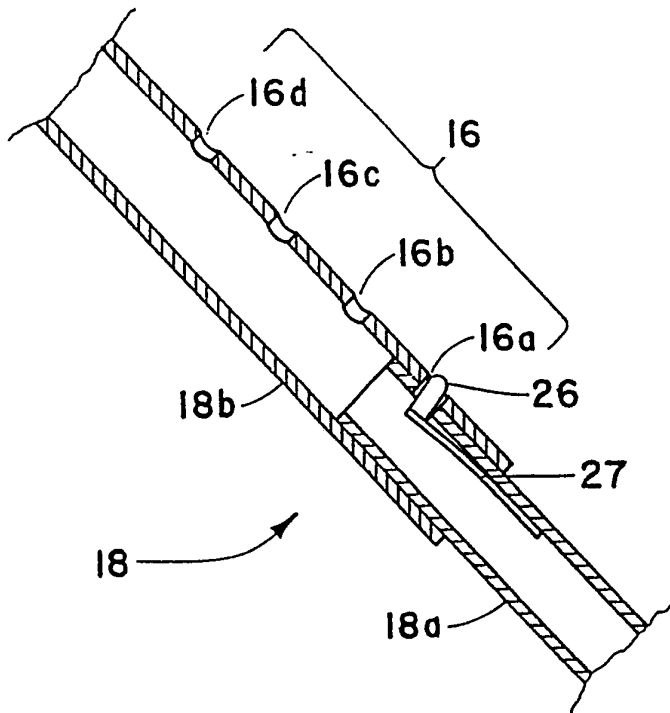


Fig. 5

INTERNATIONAL SEARCH REPORT

International Application No **PCT/US90/06140**

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ³		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC (5): B25G 1/00		
U.S. CL.: 16/111R		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁴		
Classification System	Classification Symbols	
	16/110R, 111R 15/143R 294/57, 58 56/400.17, DIG	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁵		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴		
Category *	Citation of Document, ¹⁶ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸
A	US, A, 4,704,758 (HOFFMAN) 10 November 1987 See entire document	1-17
A	GB, A, 748,446 (REANEY) 02 May 1956 See entire document	1-17
E	US, A, 4,958,407 (JOHNSON) 25 September 1990 See entire document	1-17
<p>* Special categories of cited documents: ¹⁵</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search ²		Date of Mailing of this International Search Report ²
11 December 1990		12 FEB 1991
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