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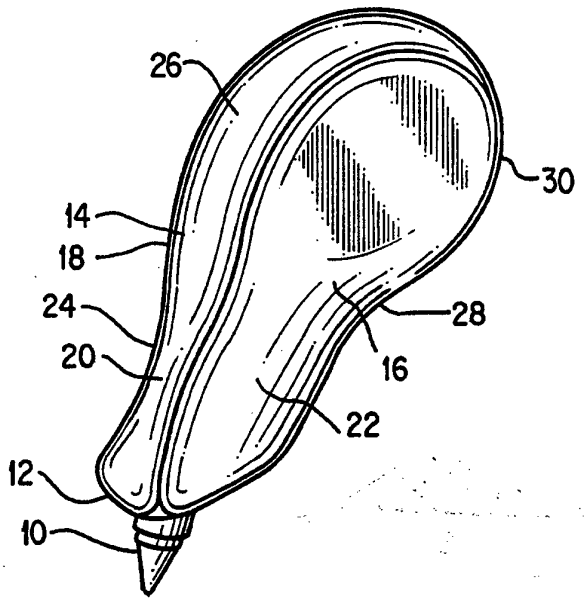

(57) Abstract

A hand-held implement which is sufficiently small so that it does not extend beyond the hand of the user and has forward (14) and side surfaces (16, 18) which are oriented so that the implement in use extends in a direction which is no further toward the thumb of the user than the index finger of the user. The forward (14) and side surfaces (16, 18) can be provided with concave contours (20, 22, 24) which engage the thumb and fingers of the user.

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SPECIFICATION

ERGONOMIC HAND-HELD IMPLEMENT

BACKGROUND OF THE INVENTION

The present invention is directed to an implement which is held in one's hand and used in manual activities. Examples of such implements include writing implements such a pens and pencils, cutting implements which contain a blade for cutting, paint brushes, cosmetics applicators and various other implements such as soldering devices, a computer stylus, etc.

In the past, such devices have generally been provided with a cylindrical shaft which is manipulated primarily by the thumb and index finger of the user, with the device contacting relatively small surfaces of the thumb and fingers. This type of device is configured so that in use the device extends in the direction between the thumb and index finger. This orientation of such implements can be considered to date back to times when feather quills were used for writing implements. Thus, the shape of the feather has governed the basic concept of the configuration of hand-held implements. However, a fundamental disadvantage for implements based upon the configuration of the feather is that the cylindrical shaft does not conform well to the surfaces of the fingers, palm and inner hand which should control the implement. This can lead to discomfort over prolonged periods of use, as the rigid surfaces of the implement create pressure points and sources for friction on the fingers. Because such implements contact a relatively small surface of the fingers, large areas of the thumb and fingers are unused and the contribution of the hand in using such hand-held implements is relatively small.

Some attempts have been made to modify hand-held implements to reduce discomfort and fatigue. For example, implements have been produced having soft rubber coating materials. However, such materials tend to reduce the control of the implement in the hand. Also, it has been proposed to provide hand-held implements with different concave surfaces. However, these surfaces have not overcome the basic problems arising from the basic idea of a cylindrical shaft oriented to extend in a direction between the thumb and index finger of the user and out of the hand.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a hand-held implement which provides high precision for performing a manual activity while simultaneously providing a high degree of comfort during prolonged use.

A further object of the invention is to provide a hand-held implement which can be held for longer periods of time with reduced fatigue of the hand.

A further object of the invention is to provide a hand-held implement which provides less friction and pressure on contact surfaces of the hand, thereby reducing the development of calluses on the hand, for example, along the third finger.

A still further object of the present invention is to provide a hand-held implement which is of a smaller size, but which provides a greater proportion of surface in contact with the hand, thus enabling greater control of the implement with increased comfort.

The above objects and others are accomplished by providing a hand-held implement which has a bottom portion from which a tool extends, e.g., a pen or pencil point, a forward surface extending upwards from the bottom portion, and first and second side surfaces extending upward from the bottom surface and rearward from the front surface. The forward surface is adapted to be engaged by the index finger of the user, and the surfaces are oriented so that in use the implement extends in a direction which is no further toward the user's thumb than the user's index finger. The implement is of sufficient size so that the implement fits comfortably in the palm and does not extend outside the palm of the user.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will now be described with reference to the accompanying drawings, in which:

Fig. 1 shows a perspective view of the hand-held implement of the present invention;

Fig. 2 shows the implement as held in a hand;

Fig. 3 shows a side view of the implement of Fig. 1;

Fig. 4 shows a side view of the implement held in a hand;

Fig. 5 shows the front view of the implement of Fig. 1; and

Fig. 6 shows a rear view of the implement of Fig. 1.

DESCRIPTION OF THE INVENTION

Referring to the figures, it can be seen that the hand-held implement of the present invention is used to carry a tool 10. In the illustrated embodiment, tool 10 is a ball point pen. However, the tool can be any one of a variety of devices which require precise manual control. Examples include other writing implements such as pencils and fountain pens, the blade for a cutting implement, a brush for painting, a brush or puff for cosmetic application, a soldering tip or a contacting device such as a computer stylus. The tool extends from the bottom portion 12 of the implement. Extending upward from the bottom portion 12 is a forward surface 14 and first and second side surfaces 16 and 18, respectively. The side surfaces 16 and 18 extend rearward from the forward surface 14. As seen in Figs. 2 and 4, in use, the forward surface is engaged by the index finger 15 of the user, the first side surface 16 is engaged by the thumb 17 of the user and the second side surface 18 is engaged by the third finger of the user.

The forward surface 14 is provided with a concave contour 20 adjacent the bottom portion 12. Similarly, the side surfaces 16 and 18 are provided with concave contours 22 and 24 adjacent the bottom portion. The concave contours are smooth and gradual, without sharp edges. Similarly, the surfaces of the implement are joined smoothly, with rounded edges. These features increase the comfort of the implement in use.

The forward surface 14 also includes a convex contour 26 extending from the concave contour 20. Again, the two portions are joined smoothly.

The implement is provided with a rearward surface 28. This surface is provided with a concave contour adjacent the bottom portion which is joined to the convex contour of the forward surface by a second convex contour 30. Again, contours 26, 28 and 30 are joined smoothly. The concave contour of the rearward surface 28 results in the implement having a reduced size in the area of the concave contours 20, 22 and 24. This permits the comfortable positioning of the third finger of the user during use, with the side of the third finger of the user engaging the concave contour 24 in the area of the end or middle joint of the finger. The convex contours 26 and 30 provide a somewhat bulbous upper

portion which provides a feeling of security when the implement is held in the hand.

Additionally, as seen particularly in Fig. 6, the width of the implement decreases in the direction of the rearward surface, particularly in the area of the concave contours 20, 22 and 24. This taper provides increased comfort and control.

Referring again to Figs. 2 and 4, it can be seen that, in use, the index finger of the user 15 extends along the forward surface 14 of the implement. Thus, the present invention in use permits the hand of the user to assume a comfortable arched configuration, with the implement being substantially co-planar with the arch defined by the index finger and corresponding portion of the palm of the user. The implement is of a sufficiently small length that it does not extend beyond the hand of the user, but rather fits within the user's hand. The bulbous upper portion extends well into the interior of the palm, with the area of convex contour 30 contacting the palm, particularly between the base of the user's index finger and the base of the thumb. When the user's hand is curled to grasp the instrument, the flesh between the thumb and fingers deforms quite readily and can comfortably accept the bulbous upper portion of the implement.

The surfaces 12, 14 and 16 are oriented so that the implement in use will extend in a direction which is preferably essentially parallel to the user's index finger, but in any event, a direction which is no further toward the thumb of the user than the index finger. Thus, instead of extending in the direction of the user's thumb or the space between the thumb and index finger, the index finger defines the limit on the direction in which the implement extends with respect to the thumb. This relationship can also be conceptualized by considering the tool 10 as defining a longitudinal axis, which is identified by numeral 31 in Fig. 2. The longitudinal axis 31 is preferably substantially parallel to the index finger of the user, but in any event is not oriented outside of the index finger in the direction of the thumb.

The implement can be of any suitable dimensions consistent with the above relationships. For example, the distance between the forward and rearward surfaces along the bottom portion can be about one inch (2.5 cm), the width of the forward surface at the bottom portion can be about three eights of an inch (1 cm), and the length

of the implement, excluding the tool, can be about two and a quarter inches (5.5 cm). Different sizes can be used to accommodate different sizes of hands.

The implement of the present invention can be made of any material suitable for the intended purpose of the implement. Examples include various polymeric materials, metal, wood and glass. It should also be noted that the side surfaces 16 and 18, in the bulbous upper portion of the device, provide a relatively smooth surface which is well-suited for application of art work, logos, advertising, etc.

While a detailed description of the present invention has been provided above, the present invention is not limited thereto, but rather is defined by the following claims.

WHAT IS CLAIMED IS:

1. A hand-held implement comprising:

a bottom portion from which a tool extends;

a forward surface extending upward from the bottom portion;

first and second side surfaces extending upward from the bottom surface and rearward from the front surface;

the forward surface being adapted to be engaged by the index finger of a user, the forward and side surfaces being oriented so that the implement in use extends in a direction which is not further toward the thumb of the user than the index finger of the user, the length of the implement being sufficiently small so that the implement does not extend beyond the hand of the user.

2. The implement of claim 1, wherein the forward and side surfaces are oriented so that the implement in use extends in a direction parallel to the user's index finger.

3. The implement of claim 1, wherein the forward surface is provided with a first concave contour.

4. The implement of claim 3, wherein the first concave contour is adjacent the bottom portion.

5. The implement of claim 1, wherein the side surfaces are each provided with a concave contour.

6. The implement of claim 5, wherein the concave contours of the side surfaces are adjacent the bottom portion.

7. The implement of claim 4, wherein the forward surface has a convex contour adjacent the first concave contour.

8. The implement of claim 3, wherein the implement has a rearward surface with a second concave contour.

9. The implement of claim 8, wherein the forward surface has a first convex contour adjacent said first concave contour, said

first convex contour being smoothly joined to said second concave contour by a second convex contour.

10. The implement of claim 8, wherein the width of the implement decreases from the first concave contour to the second concave contour.

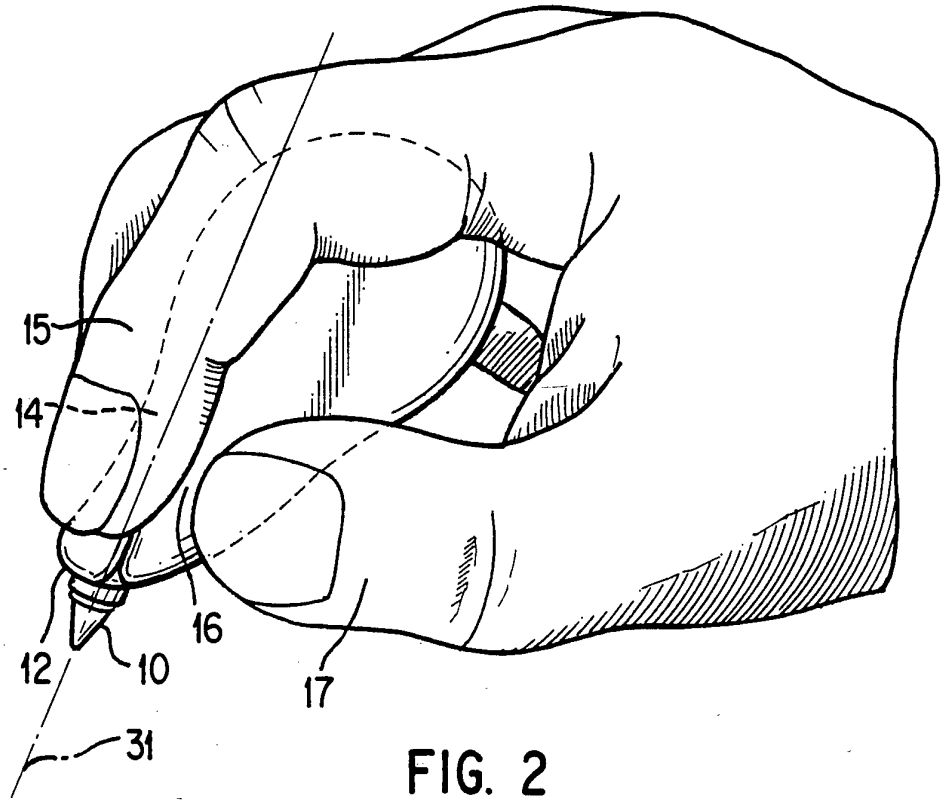

FIG. 2

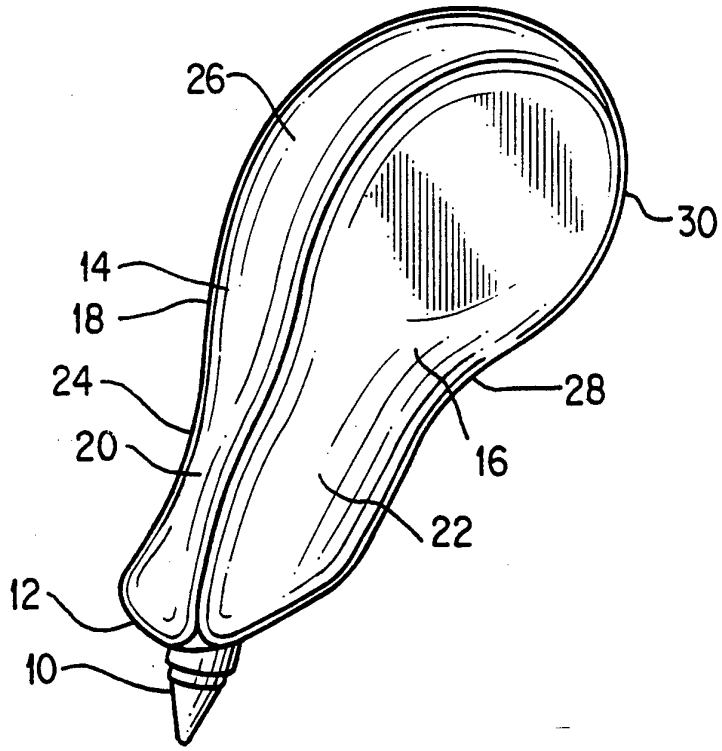

FIG. 1

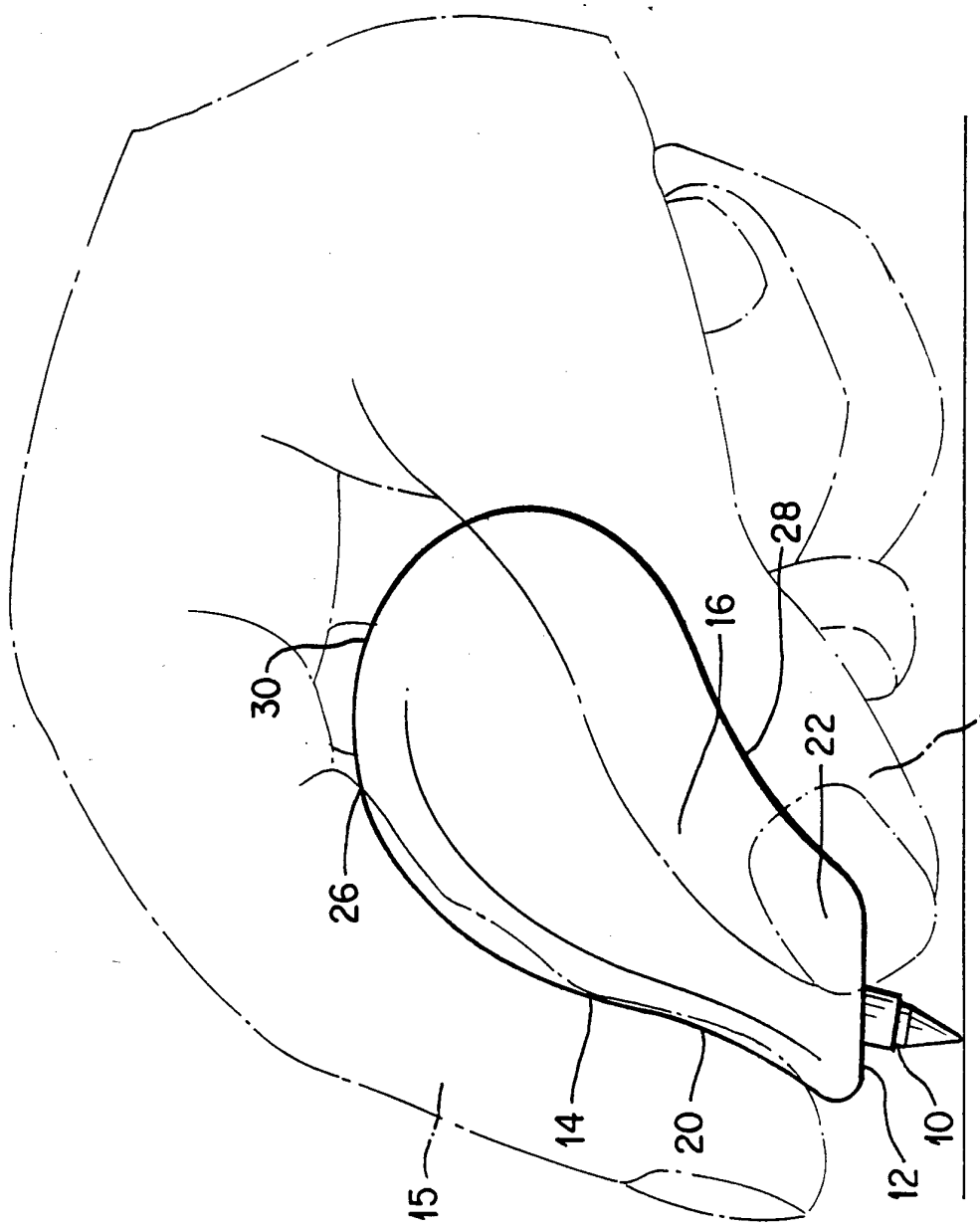

FIG. 4

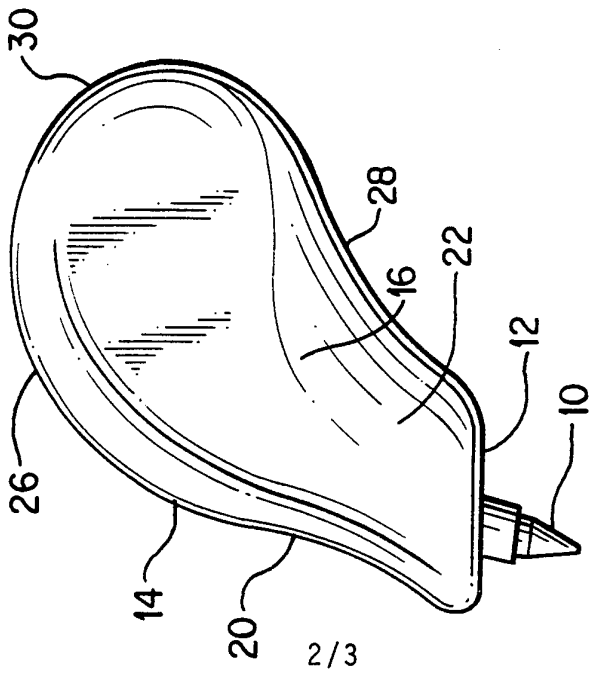

FIG. 3

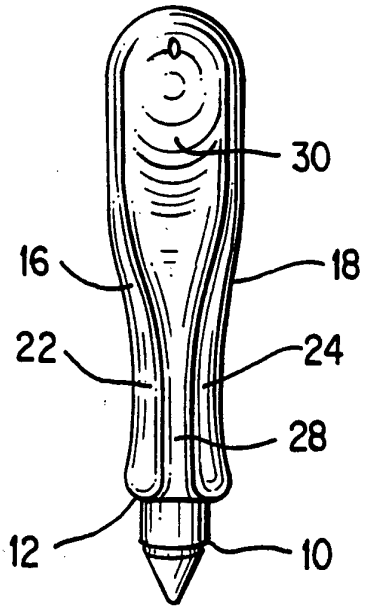

FIG. 6

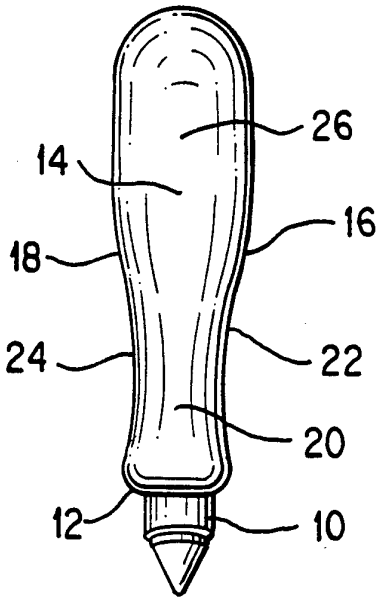

FIG. 5

INTERNATIONAL SEARCH REPORT

Inte..ational application No.
PCT/US93/06232

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) :B43K 7/00, 23/00
US CL :401/6, 7, 88'; 15/443

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 401/6, 7, 88'; 15/443

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, #3, 994, 605 (McKnight) 30 November, 1976 see entire document	1, 2
Y	US, A, #4, 037, 975 (Huffman) 26 July 1977 see entire document.	3-10

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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