

(12) **UK Patent Application** (19) **GB** (11) **2 423 698** (13) **A**

(43) Date of A Publication **06.09.2006**

(21) Application No: **0504183.5**  
(22) Date of Filing: **01.03.2005**

(71) Applicant(s):  
**Numatic International Limited**  
**(Incorporated in the United Kingdom)**  
**Millfield, CHARD, Somerset, TA20 2GB,**  
**United Kingdom**

(72) Inventor(s):  
**Christopher Robert Duncan**  
**Stephen Basil Phillips**

(74) Agent and/or Address for Service:  
**fJ Cleveland**  
**40-43 Chancery Lane, LONDON,**  
**WC2A 1JQ, United Kingdom**

(51) INT CL:  
**A47L 13/20 (2006.01)**

(52) UK CL (Edition X):  
**A4F FQM X**

(56) Documents Cited:  
**EP 1397990 A2** **WO 1998/040004 A1**  
**US 6212728 B1** **US 5133101 A**  
**US 4852210 A**

(58) Field of Search:  
INT CL<sup>7</sup> **A47L**  
Other: **Online: WPI, EPODOC**

(54) Abstract Title: **Flat mop with modified handle**

(57) The disclosure relates to an improvement to flat mops. There is provided a flat mop comprising an elongate handle portion 11 and a flat mop head 12 having a lower surface provided with a mopping layer 22, the mop head being foldable from a generally flat working configuration, in which the mopping layer is extended between opposite outer end regions of the mopping mop head, to a folded configuration in which said outer ends are moved towards each other so that the mopping layer may depend from the outer ends and permit entry of the mopping layer into a mop press for pressing thereof, characterised in that the handle portion is provided with an elongate locally modified portion 37, the modification comprising modified surface finish and/or configuration, which modification facilitates the manual rotation of the handle portion about the longitudinal axis of the handle, so as to induce the outer end regions of the mop head, when folded, to splay outwards so as to facilitate the adoption of the flat working configuration of the mop head without manual manipulation of the mop head. In the preferred embodiment, the central part 37 of the handle is provided with an enlarged grip 41 which can be of foam material.

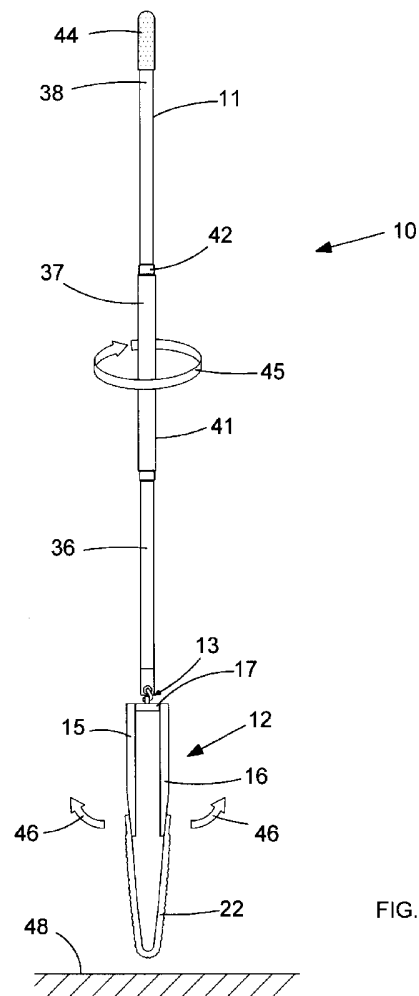


FIG.1

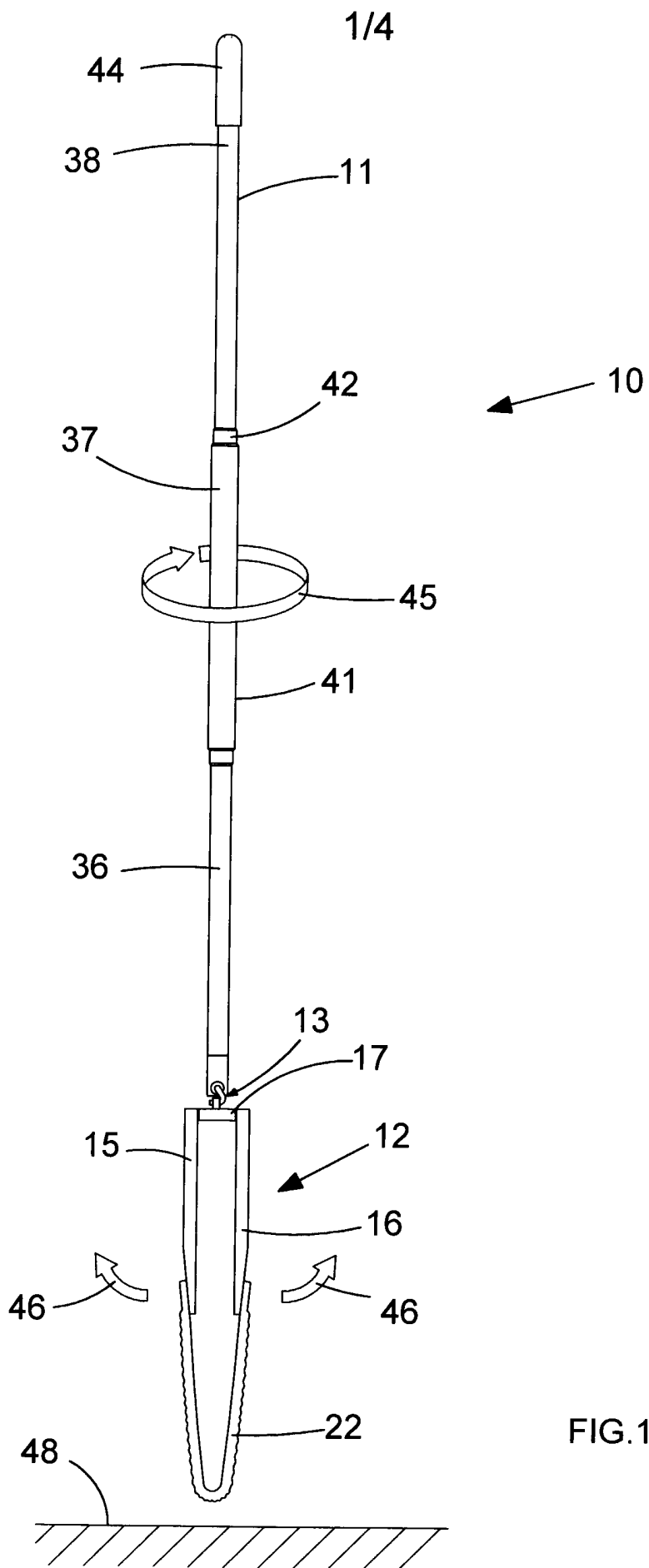


FIG.1

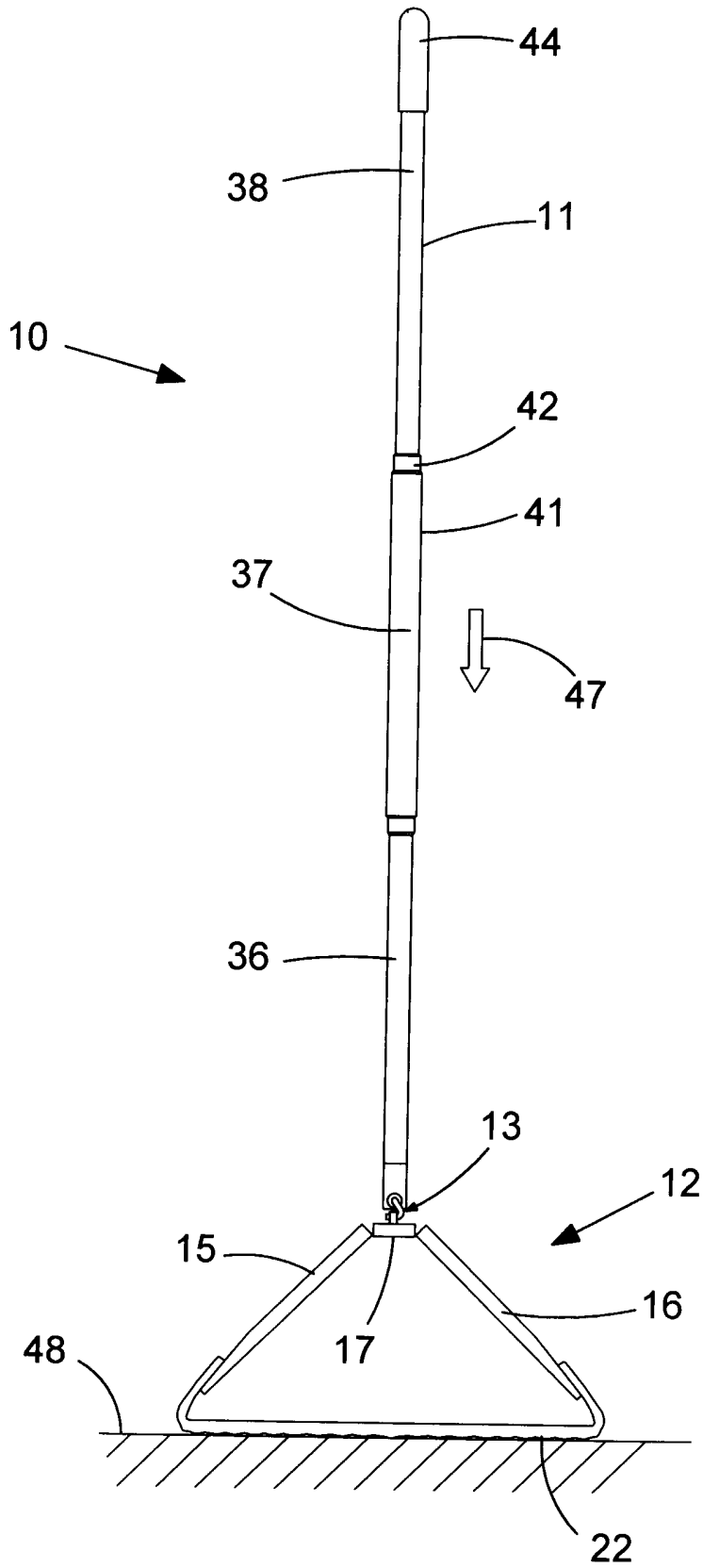


FIG.2

3/4

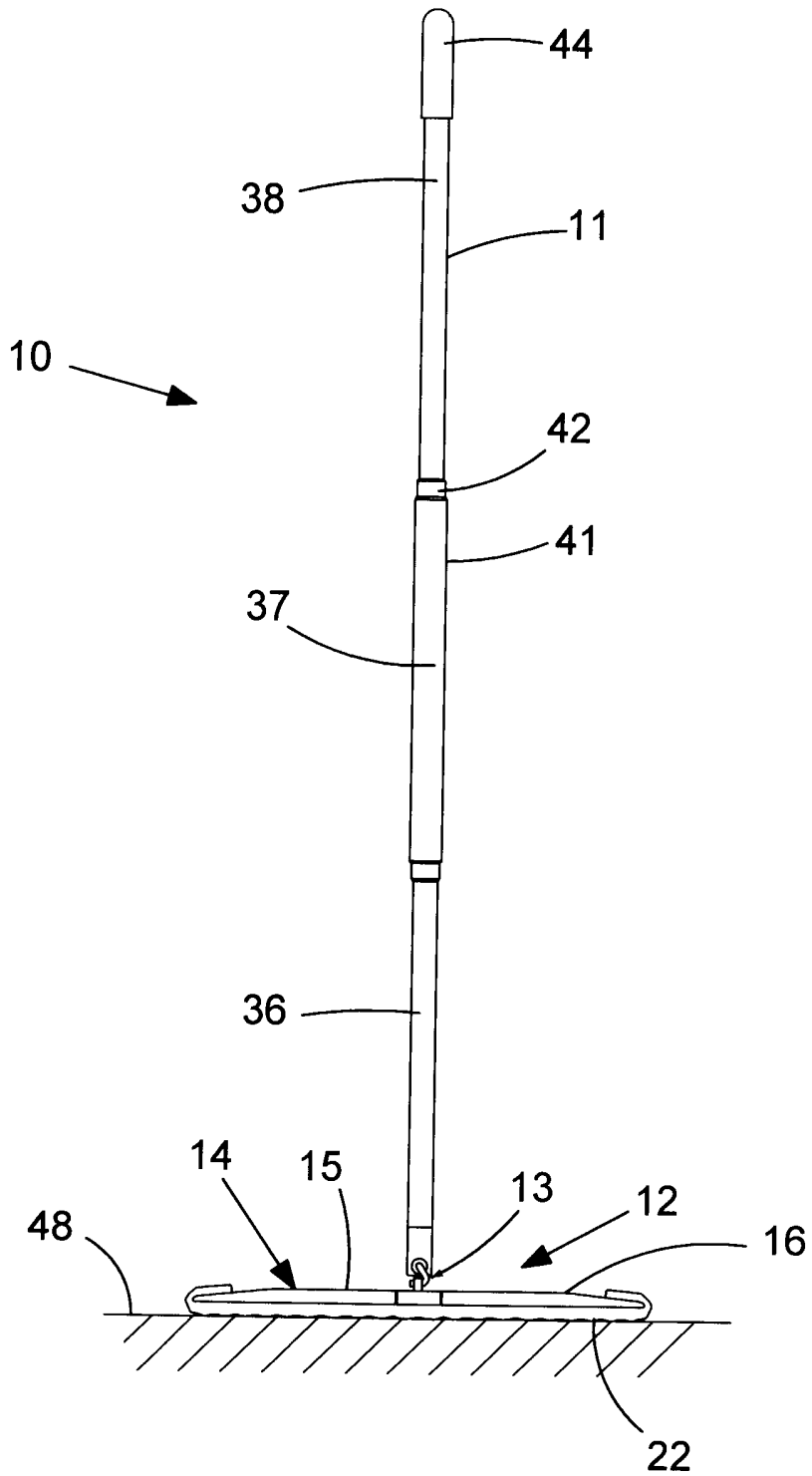


FIG.3

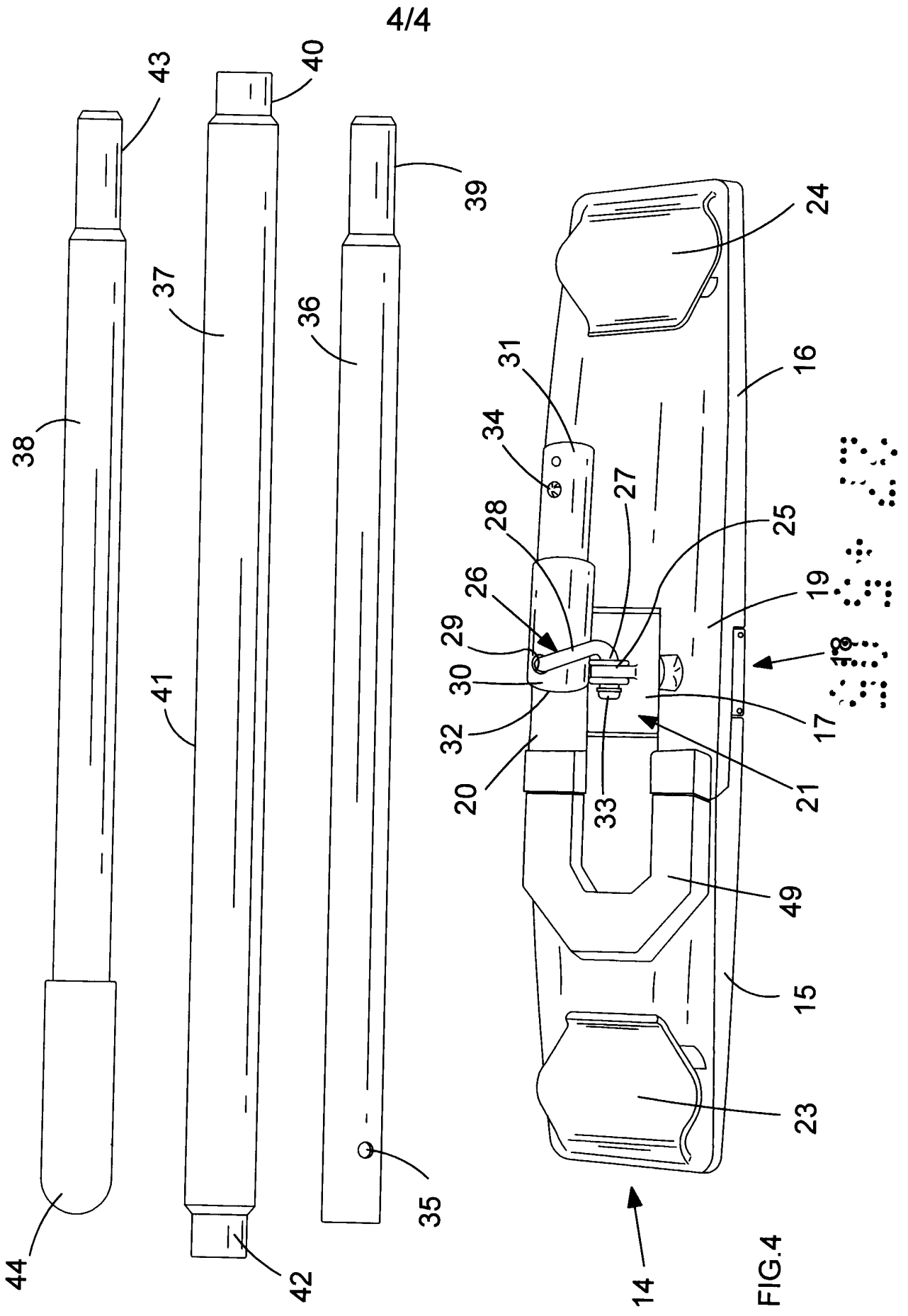


FIG.4

4/4

### Improvements Relating to Mops

This invention relates to the field of mops, in particular hanging flat mops, of the kind comprising an elongate handle and a mop head with a flat mopping surface disposed on an underside thereof.

The mop head is attached to the lower end of the handle and may be foldable from a generally flat working configuration to a folded configuration. The mop head has a lower surface, which is provided with a mopping layer. In the generally flat configuration, the mopping layer is extended between opposite outer end regions of the mop head. In this configuration, the mopping layer lies flat against the mop head. In the folded configuration, the outer ends of the mop head are moved towards each other. In this configuration the mopping layer hangs from the outer ends of the mop head. This allows the mopping layer to be free from the mop head and able to be charged with water and entered into a mop press for pressing.

One problem arises during the reconfiguration of the mop into its flat configuration after pressing or charging. In the folded configuration, the mop head ends tend to depend vertically from the handle. The natural way to flatten the mop head is to move the mop head down onto a floor surface, so that the mop head ends are urged to splay outwards and adopt a flat configuration on the floor surface. The mop head ends may then be locked in place by, for example, a snap-locking latch. However, the splaying of the mop ends can be a troublesome procedure, due to the highly restricted mechanical advantage available to the user when pressing down on the mop head to force the mop head ends to splay. Often manual manipulation is necessary to move the mop ends apart sufficiently to begin splaying. This is clearly unattractive to the user, especially where aggressive detergents may have been charged onto the mopping layer.

Hence a practice has arisen in which the user spins the mop handle about its longitudinal axis to urge the mop head ends to splay by centrifugal action. By pushing the mop head to the floor, the mop head is further forced into the flat configuration, where it can be locked in place. In this way, there is no need for the operator to bend

down to manipulate the mop head each time it has been pressed, thus saving time and avoiding the need for the operator to get wet or contaminated hands.

5 However, it is a recognised problem that the spinning action required is difficult to achieve, particularly in a wet cleaning environment where sufficient grip is hard to achieve. Hence attempts have been made to splay mop head ends by use of a handle camming surface which operates to splay the mop ends as the handle portion approaches a vertical orientation. Such an arrangement is described in WO 9840004, although it is not an ideal solution as it requires the user to adopt discrete orientations  
10 of the camming surface to achieve the desired result.

There remains a need for a method of enabling the splaying of mop head ends to be achieved more easily.

15 According to one aspect of the present invention there is provided a flat mop comprising an elongate handle portion and a flat mop head having a lower surface provided with a mopping layer, the mop head being foldable from a generally flat working configuration, in which the mopping layer is extended between opposite  
20 outer end regions of the mopping mop head, to a folded configuration in which said outer ends are moved towards each other so that the mopping layer may depend from the outer ends and permit entry of the mopping layer into a mop press for pressing thereof, wherein the handle portion is provided with an elongate locally modified portion comprising modified surface finish and/or configuration, which modification facilitates the manual rotation of the handle about the longitudinal axis of the handle,  
25 so as to induce the outer end regions of the mop head, when folded, to splay outwards so as to facilitate the adoption of the flat working configuration of the mop head without manual manipulation of the mop head.

30 According to a preferred embodiment, the modified portion comprises a sleeve portion provided on the handle portion. This enables existing handles to be altered to include a modified portion, without needing to replace the handle. More preferably, the sleeve portion comprises a resiliently flexible natural or synthetic rubber or foam. This resiliently flexible sleeve material allows for a better grip on the handle.

According to an alternative preferred embodiment, the modified portion can comprise an integral part of the handle portion.

5 According to a third embodiment, the handle portion of the flat mop comprises an assembly including a first end portion, a second end portion and a bridging portion between the end portions, wherein the locally modified portion comprises the bridging portion. Preferably, the handle portion assembly is adapted to be detachably assembled. In this way, the handle portion may be assembled before use. This allows the mop to be compactly packed for storage or prior to sale.

10

According to another embodiment, the modified portion spans a location halfway along the length of the handle portion. This enables the modified portion to be located at approximate waist height of the operator, thus maximising the amount of rotation that can be imparted to the handle.

15

According to another embodiment, the modified portion has a length between 20cm and 100cm, more preferably between 30cm and 70cm, and most preferably between 50cm and 60cm. These dimensions allow adequate length for the operator to rotate the handle using his hands on the modified portion, without needing to use the non-modified part of the handle.

20

According to another embodiment, the ratio of the length of the elongate handle to the length of modified portion is between 2:1 and 4:1, preferably between 2.5:1 and 3.5:1.

25

According to another embodiment, the modification comprises a local increase in the thickness of the handle portion relative to the rest of the handle portion. By increasing the distance between the hands of the operator, a greater torque can be produced for the same amount of force applied.

30

According to another embodiment, the modified portion comprises the provision of a non-slip surface to enhance the manual gripping thereof. This enhanced gripping allows better transmission of the rotation action from the operator to the



handle. Preferably, the non-slip surface is provided by the texturing of the modified portion.

5 According to another embodiment, the modified portion comprises a plastic moulding.

10 According to another embodiment, the modified portion comprises a resiliently gripable material. This allows better transmission of the rotation action from the operator to the handle.

15 According to a second aspect of the invention, there is provided a handle of a flat mop, which handle is provided with an elongate modified portion, the modification comprising modified surface finish and/or configuration, which modification facilitates the manual rotation of the handle about the longitudinal axis of the handle, so as to induce the outer end regions of the mop head, when folded, to splay outwards so as to facilitate the adoption of the flat working configuration of the mop head without manual manipulation of the mop head.

20 According to a third aspect of the invention, there is provided a component part of a handle, which component part provides the elongate locally modified portion, the modification comprising modified surface finish and/or configuration, which modification facilitates the manual rotation of the handle about the longitudinal axis of the handle, so as to induce the outer end regions of the mop head, when folded, to splay outwards so as to facilitate the adoption of the flat working configuration of the mop head without manual manipulation of the mop head. Preferably, the component part comprises a sleeve portion to be applied onto the handle of the flat mop.

30 Following is a description, by way of example only and with reference to the accompanying drawings, of methods of putting the present invention into effect.

In the drawings:-

Figure 1 is a front view of a mop according to the first aspect of the invention. It shows the mop head in the folded configuration.

5 Figure 2 is a front view of a mop according to the first aspect of the invention. It shows the mop head in between the folded and flat configurations.

Figure 3 is a front view of a mop according to the first aspect of the invention. It shows the mop head in the generally flat working configuration.

10 Figure 4 is a top view of a mop according to the first aspect of the invention. It shows the handle portion of the mop comprising an assembly.

The drawings show a first embodiment of a flat mop 10 comprising a handle 11 and a mop head 12. The mop head is foldable from a generally flat working  
15 configuration (Figure 3) to a folded configuration (Figure 1). The mop head is attached to the lower end of the handle via a dual axis hinge 13, described in more detail in the following. The handle is in the form of a tubular stick, typically made out of aluminium. The mop head comprises an elongate generally rectilinear body 14.

20 The mop head body 14 includes two distinct foldable portions 15, 16 corresponding to the left and right hand ends of the mop body portion. Each of the foldable portions is attached at an inside end region to a mounting bracket 17. This mounting bracket is a rectilinear member accommodated between the left and right foldable portions in the centre of the mop head body.

25 The foldable portions 15, 16 are each capable of swinging from a respective end of the bracket 17. An extension 18 of the right hand foldable portion 16 is a frame member comprising two extension arms 19, 20. The two extension arms define a cut-out 21. In the flat working configuration, the cut-out 21 accommodates the inside end  
30 region of the left hand foldable portion 15 and the mounting bracket 17.

An outer end region of each foldable portion 15, 16 of the mop is generally tapered. The upper surface of each outer end region retains each end of an absorbent mopping layer 22.

The mopping layer 22 comprises a webbing backing layer of woven material. Knitted to an underside of the webbing layer is a plurality of absorbent strands, which form the working surface of the mop. An upper surface of the webbing layer is provided at one end region with a first pouch. The pouch is attached to the webbing layer by sewing on the three sides corresponding to the edges of the webbing layer. The fourth side forms the entrance of the pouch and opens towards the opposite end region of the mopping layer. A second pouch is provided on the other end region of the webbing layer forming a mirror image of the first.

The outer end of each of the foldable portions is provided with a respective tongue portion 23, 24. These tongue portions lie above the upper surface of the foldable portions parallel thereto and extending generally towards the middle of the mope head body. In use, the two pouches accommodate the tongue portions of the foldable body portions of the mop head.

Alternatively, the mopping layer 22 can be attached to the foldable portions of the mop head by clamping each outer end region of the layer to the upper surface of the outer end of the corresponding foldable portion, or by some other releasable or permanent attachment.

The mopping layer 22 is slightly undersized in the longitudinal direction so that it is kept under longitudinal tension when the mop head is in the flat configuration. This ensures that the mopping layer does not sag or displace during use.

It will be appreciated by the skilled person that in order to fit the mopping layer it is usually necessary to fold the mop head body so that the distance between the respective outer end regions is reduced sufficiently to allow the pouches to be entered by the tongues.

As can be seen in Figure 4, on the upper surface of the mounting bracket 17 is a waisted annular collar 25. This collar is formed on an upper surface of the mounting bracket with the axis of the collar being parallel to the long axis of the mop head body. The central hole of the collar receives a lower arm 27 of a steel hinge spigot 26.

The hinge spigot has the general form of an out-of-plane “S” shape. Thus, it comprises an upper arm (not shown), continuing via a bend as diagonal element 28. This diagonal element continues via a further bend to form the lower spigot arm. The upper and lower spigot arms are aligned along respective mutually orthogonal  
5 directions.

The upper spigot arm is entered into a bore 29 in a lower end region 30 of a cylindrical connecting piece 31. This piece is tubular with a closed end 32. The piece is made of plastics material. The bore is located approximately 2cm in from the closed  
10 end of the sleeve. Each of the upper and lower spigot arms are retained for pivoting movement in the collar and bore respectively by respective end caps 33.

The connecting piece is fixed to the lower end of the mop handle 11 by entry of an upper end thereof into the hollow core of the tubular mop handle. This fixing  
15 can be by a latch mechanism, a frictional connection or a combination. The spigot member and its two pivoting spigot arms allow the handle to be moved relative to the mop head in two orthogonal axes of rotation.

For a latch mechanism, a biased bead 34 on the connecting piece may engage  
20 with a corresponding hole 35 in the lower end of the handle portion. This connection is releasable upon the depressing of the bead.

For a frictional connection, one end to be connected is of an outer diameter to enable it to be closely fitted inside the inside diameter of the other end to be  
25 connected.

In a similar way, as can be seen in Figure 4, the component parts of the handle 11 can be connected via such a latch mechanism or friction connection, or a combination. Other connection means will be within the knowledge of the skilled  
30 person.

The mop handle includes three elongate tubular portions 36, 37, 38. The lower end portion 36 is attached to the hinge connecting piece as hereinbefore described. The opposite end of the lower end is formed with a shoulder taper 39 of reduced

diameter. This taper is received in a corresponding female portion of a lower end 40 of a tubular handle central portion 37. Engagement is by means an intimate friction fit.

5 The central portion 37 is formed with a raised external surface 41 having an increase in diameter as compared to that of the handle as a whole. This provides an increased diameter for manual gripping of the handle, which is an aide to manual spinning of the handle about the longitudinal axis thereof. The raised external surface may be provided by integral shaping of the central portion with an increased diameter, so that  
10 the central portion is formed as a unitary moulding. Furthermore, the surface may be provided with surface texture such as roughening or patterning (not shown). This further aides gripping of the central portion.

In an alternative embodiment, the raised surface is provided by a sleeve fixed  
15 over a central tubular core (not shown) of the central portion. This sleeve is preferably formed of resiliently flexible material such as foam, particularly an elastomeric material, such as a closed cell foam.

This central portion spans a notional halfway point of the handle. As shown in  
20 the drawings, the central portion has a length of approximately one third of the total length of the handle 11.

An open upper end 42 of the central portion 37 receives a corresponding male shoulder taper 43 of an upper end portion 38 of the handle. Thus the upper end portion  
25 is friction fitted to the central portion. The upper end portion is an elongate tubular member, formed at a free end thereof with a rubberised cylindrical upper hand grip 44.

In Figure 1, the mop head 12 is in the folded configuration. The foldable  
30 portions 15, 16 hang vertically downwards under gravity. The mopping layer 22 hangs down in a loop under the influence of its own weight from the outer ends of the foldable portions. In this configuration, the mopping layer is capable of being replenished with water and being pressed in a mop press. For adoption of the generally flat configuration, a spinning action 45 is applied to the modified central

portion 37 of the handle 11. The centrifugal force 46 created causes the foldable portions 15, 16 to splay outwards.

Figure 2 shows the foldable portions 15, 16 when they have been splayed  
5 outwards by the centrifugal force. A downwards force 47 is then applied to the mop. This causes the foldable portions to splay further upon contact with the floor 48. This downwards force 47 causes the foldable portions to form a generally flat surface.

Figure 3 shows the mop head 12 in this generally flat configuration. In this  
10 configuration, the foldable portions 15, 16 can be locked together. Hence, when the mop head is lifted from the floor, the foldable portions stay in the generally flat configuration and do not fall back into the folded configuration under gravity. The locking mechanism (seen in Figure 4) is normally situated on the upper surface of the mop head body. It comprises a release mechanism in the form of a conventional latch  
15 49, which can be unlocked by applying downward pressure, for example, by the user's foot. Hence, the flat configuration can be changed to the folded configuration by unlocking the mechanism and lifting the mop off the floor.

In Figure 4, this release mechanism 49 has a release latch in the form of a  
20 "U".

In use, an operator starts with the flat mop in the folded configuration. The mopping layer is (re)plenished with water and/or cleaning fluid and pressed in a mop press. The flat mop is then spun into the flat working configuration. By applying a  
25 rotational torque force to the modified portion 37 of the handle, this force is effectively transmitted to the handle 11. Due to the hinge spigot 26, the mop head 12 and handle 11 do not move relative to each other in the axis of rotation of the handle. Hence, the torque force applied causes the mop head body to rotate. The centrifugal force 46 created causes the foldable portions 15, 16 to splay outwards. By pressing the  
30 mop head to the floor, these foldable portions are further splayed into the flat working configuration. The flat mop is then locked in this flat configuration using the latch 49. The mop is then used to clean a floor surface. When the mopping layer 22 is needed to be replenished with water, the latch 49 is released and the mop lifted from the floor surface. The foldable portions 15, 16 fall under gravity into the folded configuration

and the mopping layer falls in a loop under its own weight. The moping layer can then be replenished and pressed in a mop. The cycle can be then repeated as many times as is necessary.

**Claims**

1. A flat mop comprising an elongate handle portion and a flat mop head having a lower surface provided with a mopping layer, the mop head being foldable from a generally flat working configuration, in which the mopping layer is extended between opposite outer end regions of the mopping mop head, to a folded configuration in which said outer ends are moved towards each other so that the mopping layer may depend from the outer ends and permit entry of the mopping layer into a mop press for pressing thereof,  
5
- 10 characterised in that the handle portion is provided with an elongate locally modified portion, the modification comprising modified surface finish and/or configuration, which modification facilitates the manual rotation of the handle portion about the longitudinal axis of the handle, so as to induce the outer end regions of the mop head, when folded, to splay outwards so as to facilitate the adoption of the flat working  
15 configuration of the mop head without manual manipulation of the mop head.
2. A flat mop according to claim 1, wherein the modified portion comprises a sleeve portion provided on the handle portion.
- 20 3. A flat mop according to claim 2, wherein said sleeve portion comprises a resiliently flexible natural or synthetic rubber or foam
4. A flat mop according to claim 1, wherein the modified portion forms an integral part of the handle portion.  
25
5. A flat mop as claimed in any preceding claim, wherein the handle portion comprises an assembly including a first end portion, a second end portion and a bridging portion between the end portions, wherein the locally modified portion comprises the bridging portion.  
30
6. A flat mop as claimed in claim 5, wherein the handle portion assembly is adapted to be detachably assembled, so that the handle portion may be assembled before use.



7. A flat mop according to any preceding claim, wherein the elongate modified portion spans a location halfway along the length of the handle portion.
8. A flat mop according to any preceding claim, wherein the modified portion  
5 has a length between 20cm and 100cm.
9. A flat mop according to claim 8, wherein the modified portion has a length between 30cm and 70cm.
10. A flat mop according to claim 9, wherein the modified portion has a length  
10 between 50cm and 60cm.
11. A flat mop according to any preceding claim, wherein the ratio of the length of the elongate handle to the length of modified portion is between 2:1 and 4:1.  
15
12. A flat mop according to claim 11, wherein the ratio of the length of the elongate handle to the length of modified portion is between 2.5:1 and 3.5:1.
13. A flat mop according to any of the preceding claims, wherein the modification  
20 comprises a local increase in the thickness of the handle portion relative to the rest of the handle portion.
14. A flat mop according to any of the preceding claims, wherein the modification  
25 comprises the provision of a non-slip surface to enhance manual gripping thereof.
15. A flat mop according to claim 14, wherein the non-slip surface is provided by texturing of the modified portion.
16. A flat mop according to any of the preceding claims, wherein the modified  
30 portion comprises a plastic moulding.
17. A flat mop according to any of the preceding claims, wherein the modified portion comprises a resiliently gripable material.

18. A handle of a flat mop as claimed in claim 1 which handle is provided with an elongate locally modified portion, the modification comprising modified surface finish and/or configuration, which modification facilitates the manual rotation of the handle about the longitudinal axis of the handle, so as to induce the outer end regions of the mop head, when folded, to splay outwards so as to facilitate the adoption of the flat working configuration of the mop head without manual manipulation of the mop head.
19. A component part of a handle according to claim 18 which component part provides the elongate locally modified portion, the modification comprising modified surface finish and/or configuration, which modification facilitates the manual rotation of the handle about the longitudinal axis of the handle, so as to induce the outer end regions of the mop head, when folded, to splay outwards so as to facilitate the adoption of the flat working configuration of the mop head without manual manipulation of the mop head.
20. A component part as claimed in claim 19 which comprises a sleeve portion to be applied onto the handle of the flat mop.
21. A flat mop substantially as described hereinbefore with reference to and as illustrated in the accompanying drawings.
22. A handle of a flat mop substantially as described hereinbefore with reference to and as illustrated in the accompanying drawings.
23. A component part of a handle of a flat mop substantially as described hereinbefore with reference to and as illustrated in the accompanying drawings.



INVESTOR IN PEOPLE

Application No: GB0504183.5

Examiner: John Wilson

Claims searched: 1-23

Date of search: 14 June 2005

### Patents Act 1977: Search Report under Section 17

#### Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
Y	1-5, 7-20	WO 98/40004 A1 Numatic - acknowledged in specification
Y	1-5, 7-20	EP 1397990 A2 Casajuana - see the figs. and description
Y	1-5, 7-20	US5133101 A Hauser & Houston - see the figs. - foam rubber grips - see col. 2 ll.27-28, col. 3 l.22, col. 3 ll. 56-58
Y	1-5, 7-20	US4852210 A Krajicek - see hand grip 4 - see col. 2 ll.48-53
Y	1-5, 7-20	US6212728 B1 Facca et al - grip 41 - see col. 4 ll. 24-30

#### Categories:

X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art
Y Document indicating lack of inventive step if combined with one or more other documents of same category	P Document published on or after the declared priority date but before the filing date of this invention
& Member of the same patent family	E Patent document published on or after, but with priority date earlier than, the filing date of this application

#### Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>X</sup> :

Worldwide search of patent documents classified in the following areas of the IPC<sup>07</sup>

A47L

The following online and other databases have been used in the preparation of this search report

Online: WPI, EPODOC