June 4, 1968 W. FEINE 3,386,124

HAND ROLLER

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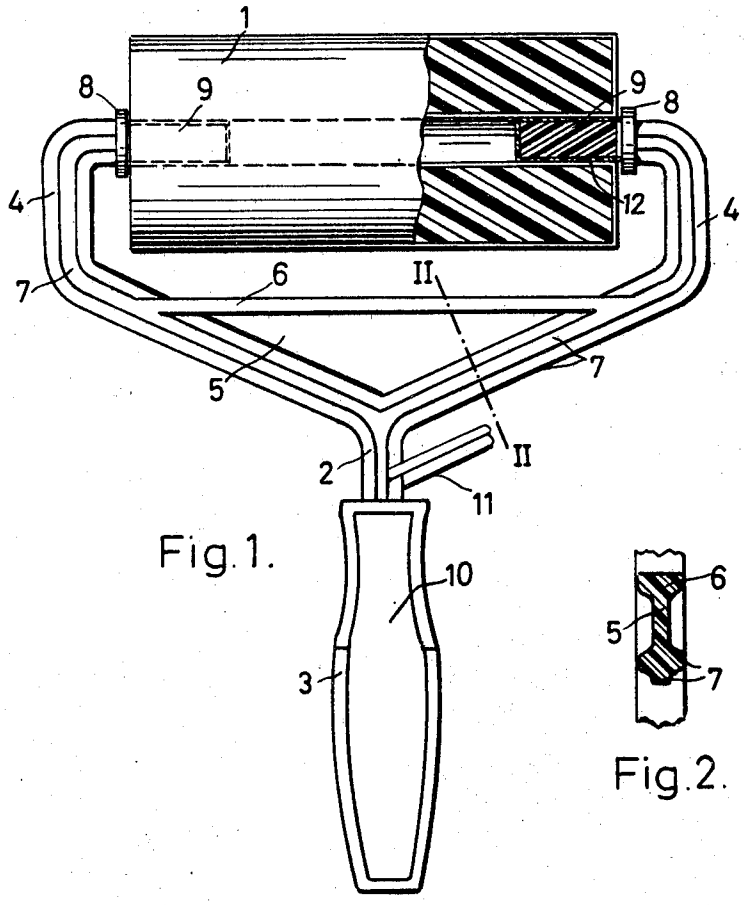


Fig. 1.

Fig. 2.

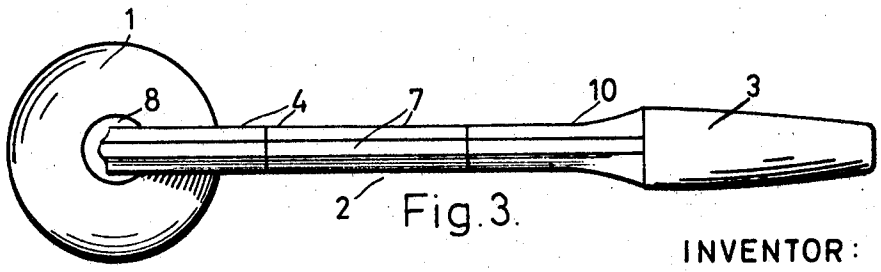


Fig. 3.

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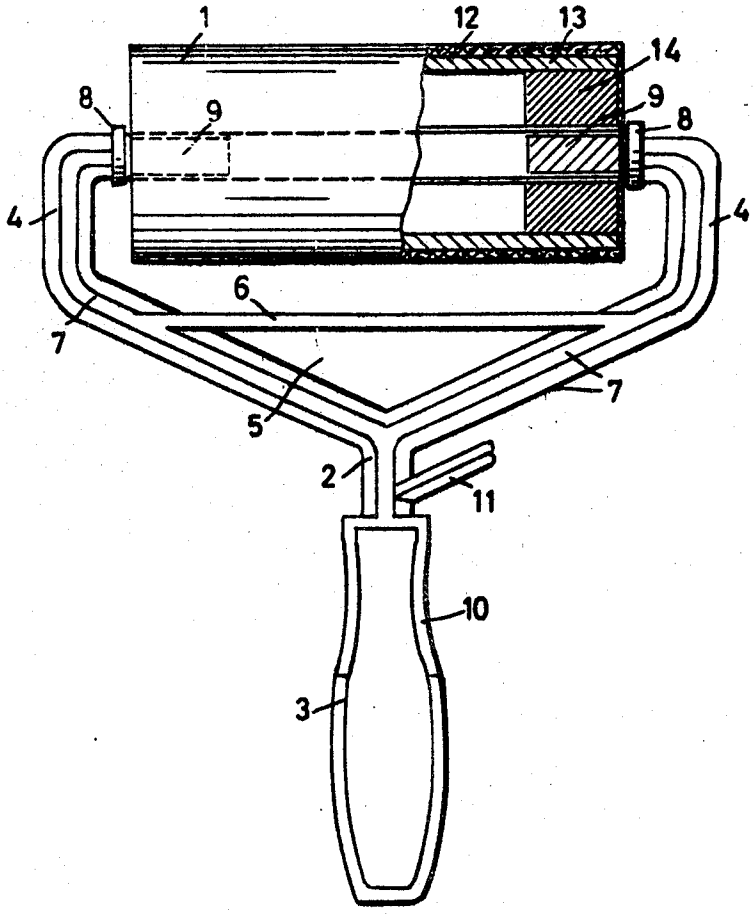


Fig.4.

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HAND ROLLER

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ABSTRACT OF THE DISCLOSURE

This disclosure teaches a handle for interchangeable paint rollers. The invention resides in a simplified, superior, one-piece handle structure which comprises a hand piece with arms connected thereto and which can be stretched apart and on relaxation of the stretching positioned to journal bearings therebetween on which a roller is axially mounted. The present handle is characterized in that the arms are joined by an integral triangular web with an enlarged base forming a crossbar and joining ribs of the arms. By this arrangement an inexpensive, light and strong roller handle is produced which accommodates sufficient yield for work on uneven surfaces, resists twists and permits easy changing of rollers. Three degrees of elasticity are provided in three mutually normal directions.

This disclosure relates to hand rollers and like apparatus with interchangeable rollers, especially those for applying paints and for pressing on foils. The invention resides in a simplified handle structure.

Usual hand rollers consist of a considerable number of parts. More especially when using interchangeable or replaceable roller elements, it has been necessary hitherto to employ screw components, which can easily become lost. For strength reasons, metal components were frequently employed, which made the operation of the roller difficult because of their considerable weight. Such metal components were also liable to corrode, and especially when applying liquid paints or colours, this led to changes or impurities in the colour. The use of several components and materials had the additional disadvantage that manufacture was uneconomic and necessitated a separate assembly operation.

According to the present invention (as applied to hand rollers) there is provided such a device, for applying paints and for pressing on foils, which comprises a replaceable roller element mounted by means of two resilient arms having axle journals, the arms together with a hand piece forming a one-piece plastic handle with reinforcing ribs, wherein a triangular web is provided which is formed with a cross bar or base rib connecting the arms.

The hand roller according to this invention thus consists essentially of only two components, namely, the replaceable roller element and a plastic handle which simultaneously constitutes the hand-piece and mounting elements for the roller. Reinforcing ribs and a crossbar provide this handle with strength. The inlaying or embedding of reinforcing parts is thus superfluous. The arms are resilient, so that the replacement of the roller element can be effected in an extremely simple manner by bending the arms outwardly. Furthermore, these arms give the hand roller a certain elasticity, which is very important for working on uneven surface areas. The handle should be of such dimensions that the necessary flexural stiffness is provided. Any corrosion-resistant plastic, for example polyethylene, is suitable as the material.

This construction provides flexural stiffness and elasticity of the plastic component while being of low weight.

The two resilient arms are so interconnected to reduce twisting or bending thereof while the hand roller is being manipulated. The crossbar also increases the strength of the handle to such a high degree that metallic reinforcing parts are not normally required.

Another preferred feature of the invention consists in that the base rib is at least as long as the internal width between the ends of the axle journals. The effect hereby obtained is that the bending of the resilient arms can only occur beyond the points of connection with the crossbar. The springing of the arms is therefore comparatively hard and the flexural stiffness thereof is high.

In a further development of the invention, the axle journals of the resilient arms comprise stop collars. Such a stop collar limits the axial movement of the roller element which is rotatably mounted on the axle journals. When the roller is used for applying liquid paints or the like, the penetration of liquid into the interior of the roller element is moreover made difficult or prevented by the stop collars.

It is also preferable for the hand piece to be provided with a recess for engagement by the thumb. Since the pressure-applying force is substantially transmitted by the thumb when manipulating the roller, such recesses for receiving the thumb are very advantageous. Thus, without any increase in weight, a rigid handle is provided by which the manipulation of the hand roller is very greatly facilitated.

Another preferred feature of the invention is characterised by the hand piece being arranged symmetrically of the resilient arms. This measure provides a balancing of the weight, which prevents unbalance of the hand roller on either side. For particular uses, however, constructional forms are of course also possible in which the hand piece is arranged eccentrically.

Another feature of the invention which is advantageous is that in which the plastic component comprises above the hand piece a projection which extends parallel to one arm and thus forms a slot. A hand roller constructed in this way can conveniently be hung on the rim of a pail, where it is held by its own weight and permits paint to drip into the tray.

It is also very expedient for the roller element to consist of a core, for example of impregnated cardboard, the core having bushings and an outer fibre covering, consisting for example of lambskin or velvet. Such a roller element is particularly suitable for applying liquid paints or the like. The roller elements constructed in this manner are especially light in weight while having sufficient strength. The fibre covering can be impregnated with the paint which is to be applied. The bushings make possible a simple and safe mounting into which only a small amount of liquid can penetrate.

It is also expedient for the core to consist of a cardboard tube which is closed by means of plastic discs which simultaneously forms the bushings. The use of plastic discs provides the advantage that changes in colour or contamination due to corrosion or rust cannot occur. The formation of the plastic discs in one piece with the bushings additionally produces a further simplification and reduction in cost, since the number of components is further reduced. In addition, it is possible to dispense with the troublesome metal tube which was formerly necessary and generally consisted of costly brass or bronze.

The handle which comprises the hand piece resilient arms and crossbar, can be produced in expedient and inexpensive manner by the injection-moulding process. The roller elements can be replaced in an extremely simple way by the resilient arms being bent outwardly, without any tool being necessary for this operation.

These and other features will appear more fully from the accompanying drawing wherein:

FIGURE 1 is a plan view of a hand roller according to this invention with the roller element partly in section.

FIGURE 2 is a section taken along line II—II of FIGURE 1.

FIGURE 3 is a side elevation of the hand roller of FIGURE 1.

FIGURE 4 shows a somewhat differently constructed roller partly in section.

A hand roller according to the invention is shown in plan view in FIGURE 1. In this figure, roller element **1** is shown partly in section. Handle **2** consists of hand piece **3**, resilient arms **4** and web **5**. The latter has base rib or cross bar **6**, which leads into reinforcing ribs **7** of resilient arms **4** and of hand piece **3**. Provided on the bent-over ends of resilient arms **4** are axle journals **9** with stop collars **8**. Roller element **1** is mounted on axle journals **9** by means of plastic inserts **12** which serve as bushings. Hand piece **3** is formed with recess **10** which serves as a support for the thumb. Above the recess is projection **11**, which forms a slot with reinforcing ribs **7** and permits the hand roller to be placed on the rim of a pail.

A cross-section along the line II—II of FIGURE 1 and through handle **2** is shown in FIGURE 2. It is seen that web **5** can be produced with economy of material by base rib or cross bar **6** and reinforcing ribs **7** providing sufficient flexural stiffness for handle **2**.

A side elevation of the hand roller according to FIGURE 1 is shown in FIGURE 3. It can be seen from this figure that handle **2** is in one piece with hand piece **3** and resilient arms **4**, reinforcing ribs **7** ensuring an adequate flexural stiffness of the entire handle **2**. Recess **10** on hand piece **3** is provided as a thumb support. On the ends of resilient arms **4** are stop collars **8** of axle journals **9** on which roller element **1** is mounted.

The roller can be manufactured in a simple manner and is of very small weight.

For example the roller in FIGURE 4 comprises core **13** of impregnated cardboard with journals **14** of plastic and an outer fiber cover **12** made of lamb skin, velvet or the like.

It will be understood by those familiar with the manufacture of hand rollers and the like that wide deviations from the shown embodiment may be made without departing from the spirit of invention set forth in the claims.

What is claimed is:

1. A handle for a rotatable tool and formed of plastic as a unit and comprising
- a hand piece joined to two arms,
- each of the arms having an axle journal formed thereon and adapted to engage the tool therebetween for rotational mounting,
- the arms elastically separable from a relaxed condition wherein both axle journals engage the tool
- to a strained condition
  - wherein the tool can clear the axle journals,
- each of the arms having at least one reinforcing rib,
- the arms joined by a triangular web,
- the web formed with an enlarged crossbar remote from the hand piece and leading into the reinforcing rib of each arm.

2. The handle of claim **1** with
- the crossbar at least as long as the clearance between the axle journals with the arm in its relaxed condition.

3. The handle of claim **2** with
- the arms and the hand piece arranged substantially in a common plane and with
- the arms substantially symmetrical relative the hand piece.

4. A hand roller suitable for applying liquid paints and the like as well as for pressing on foil, and comprising
- a substantially cylindrical roller element adaptable for rotation about its axis,
- the roller element defining a recess at each of its ends with each recess arranged to receive an axle journal,
- a handle formed as a single plastic unit and including a hand piece joined to two arms with an axle journal formed on each of the arms,
- the arms elastically separable from a relaxed condition wherein each of the axle journals fit into one of the recesses
- to a strained condition
  - wherein the roller element can clear the axle journals,
- each of the arms having at least one reinforcing rib,
- the arms joined by a triangular web,
- the web formed with an enlarged crossbar remote from the hand piece and leading into the reinforcing rib of each arm.

5. The hand roller of claim **4** with
- the crossbar at least as long as the clearance between the axle journals with the arms in their relaxed condition.

6. The hand roller of claim **5** with stop collars formed on each of the arms and adapted to contact the roller element about the recesses in moveable sealing engagement.

7. The hand roller of claim **6** with a plastic insert positioned in sealing engagement in each of the recesses to serve as bushings for the axle journals.

8. The hand roller of claim **7** with the roller element made of cardboard and having an outer fibre covering.

9. The hand roller of claim **8** with
- the arms and the hand piece arranged substantially in a common plane and with,
- the arms substantially symmetrical relative the hand piece.

10. The hand roller of claim **9** with the plastic member having a projection which extends substantially parallel to one of the arms so as to form a hook-like slot.

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