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(56) Documents cited

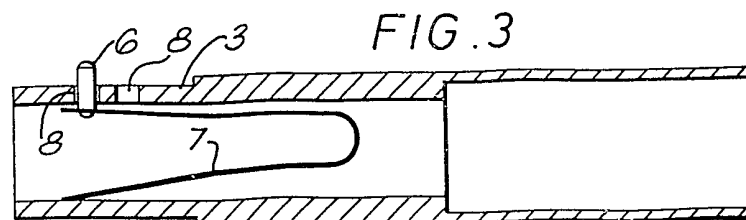
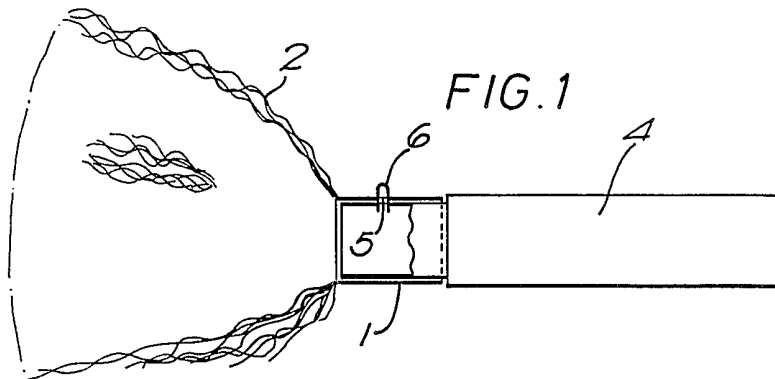
GB 2226379 A GB 1382522 A US 4247216 A

(58) Field of search

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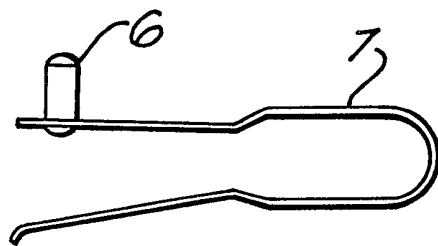
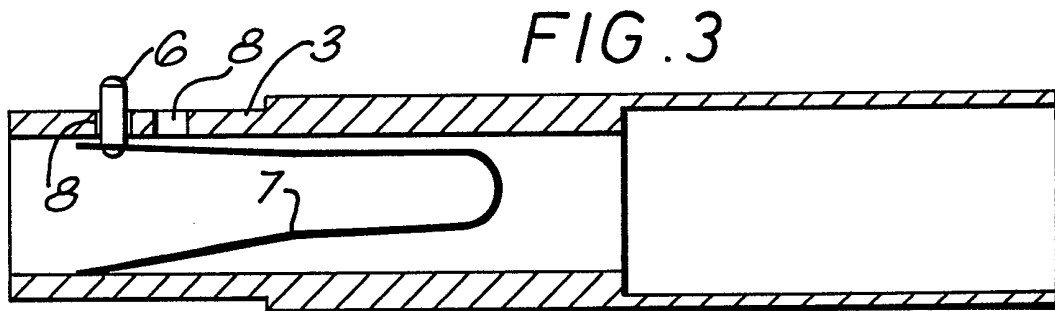
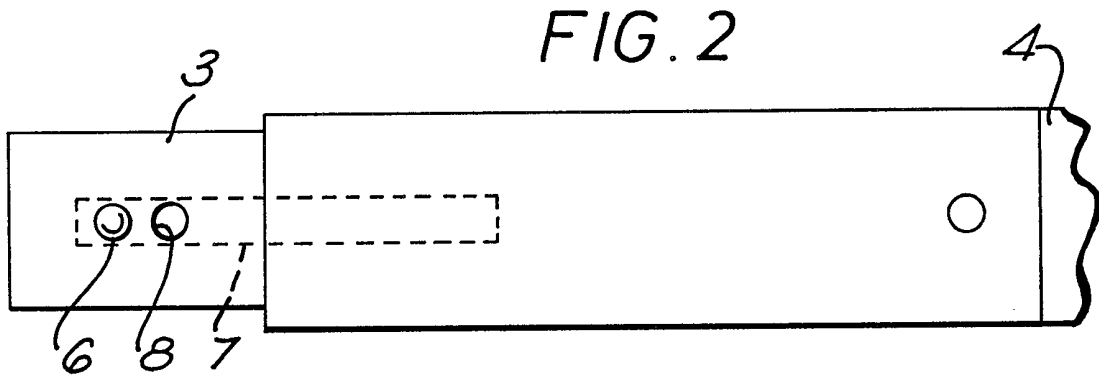
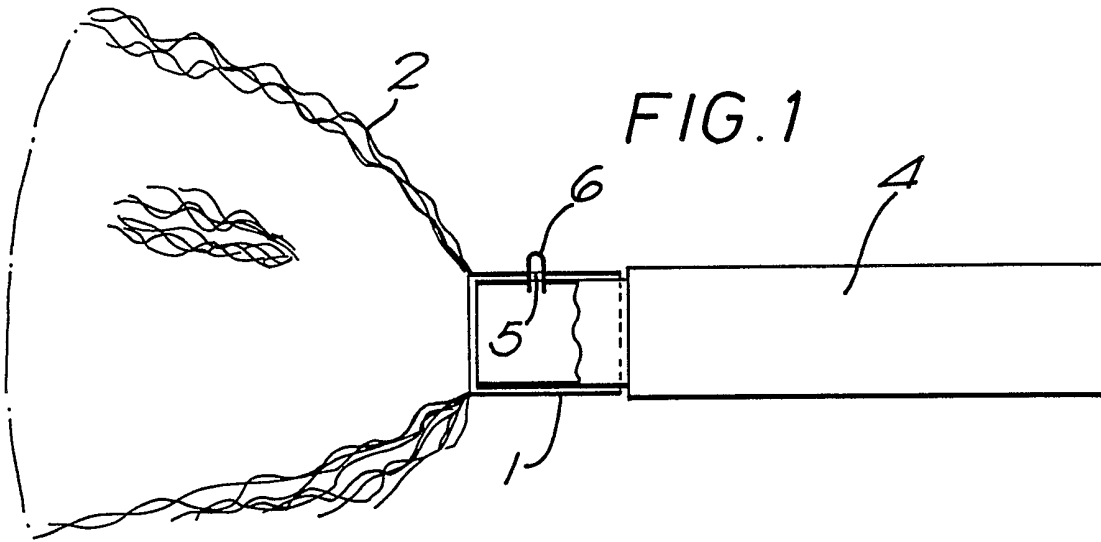
(54) Couplings for joining tubular members

(57) A coupling for releasably joining together in a substantially rigid manner two tubular members whose dimensions are such that one (3) can slide within the other (1) with its external surface in contact with the internal surface of the other. A twin-armed spring (7) is located within one tubular member (3) and one arm of the spring carries an outwardly extending pin (6) which protrudes through complementary apertures (8) formed in the two tubular members. The arrangement is such that the spring is freely mounted within the said one tubular member and is not physically attached thereto. The coupling may be for connecting a mop (2), used for applying hot bitumen to roofing surfaces, to a tubular stem of a handle (4).



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.



Couplings for Joining Together Tubular Members

This invention relates to couplings for joining together two tubular members in a substantially rigid manner. More particularly, but not exclusively, the invention relates to couplings for releasably connecting a tubular stem of a tool to a complementary stem of a handle. The invention has especial relevance to couplings for releasably connecting a tool such as a mop for use in applying high temperature media such as bitumen to roof and other surfaces. The invention is, however, not limited to these tools and has application to a wide range of tools, these including domestic mops and brooms, paint rollers, garden instruments and the like.

Conventionally, a tool such as a mop is connected to its handle by driving a nail or screw through a hole formed in a tubular stem of the tool and that part of the handle received by the tool stem. Replacement of the tool consequently requires removal of the screw or nail from the handle which is both time consuming and likely, in time, to lead to damage of the handle. In situations where the tool requires to be replaced frequently the problems outlined above are exasperated. A tool which does require frequent replacement is a mop used for applying hot bitumen to roofing surfaces. Currently, felt roofers use large numbers of woollen mops mounted on wooden handles to apply hot bitumen to roofing surfaces, these mops being secured to the handle in the manner described above, that is to say by a nail which passes through the mop stem and the handle at approximately 45° the nail being turned through an angle to hold the mop on the handle.

Quick release mechanisms for releasably connecting a tool to its handle are, of course, well known. Such mechanisms conventionally include a "bayonet-type" fitting or a spring loaded bearing or pin carried by the stem of the tool or the handle which can be depressed to enter an aperture formed in the handle or tool stem as the case may be to locate the tool on the handle. In the particular felt roofing application described above, a conventional spring loaded coupling would quickly be

damaged and become inoperable through the heat and consistency of the applied bitumen thereby necessitating replacement of not only the tool but also probably, the handle.

The present invention sets out to provide couplings which overcome or at least alleviate these disadvantages.

According to the present invention in one aspect, there is provided a coupling for releasably joining together two tubular members in a substantially rigid manner, the dimensions of one such tubular member being such that it can slide within the other tubular member with its external surface in contact with the internal surface of said other tubular member, and a twin-armed spring located within the said one tubular member, one arm of the spring carrying an outwardly extending pin which protrudes through complementary apertures formed in the two tubular members, the arrangement being such that the spring is freely mounted within the said one tubular member and is not physically attached thereto.

The spring is preferably of generally "U" or "V" configuration.

The said one tubular member may be formed with a plurality of apertures each spaced a different distance from its open end and each being dimensioned to receive the distal end of the spring-mounted pin.

In another aspect the invention provides a mop for application of high temperature materials to surfaces, the tubular stems of a head and handle of the mop being

joined by a coupling as described in the preceeding three paragraphs.

The invention will now be described by way of example only with reference to the accompanying diagrammatic drawings in which:-

Figure 1 is a side view partly in section of a coupling in accordance with the invention fitted to a mop for applying hot bitumen to roofing and other surfaces:

Figure 2 is a side view in greater detail of one tubular member of the coupling illustrated in Figure 1:

Figure 3 is a cross-section of the coupling member illustrated in Figure 2; and

Figure 4 is a side view of a spring which forms part of the coupling illustrated in Figures 1 and 2.

The coupling illustrated comprises a tubular stem 1 of a mop 2 into which can slide a tubular stem 3 of a handle 4. The stem 1 is formed with apertures 5 of a size to receive the head of a pin 6 carried by a flat spring 7. If more than one aperture 5 is provided each is positioned a different distance from the open-end of the stem. The spring 7 is positioned within the interior of the tubular stem 3 and the pin 6 protrudes through one of a pair of apertures 8 formed in a side of the stem 3. The apertures 8 are positioned a different distance from the open end of the stem 3. In an alternative arrangement, the spring 7 can seat within the interior of the stem 1, the head of the pin 6 then protruding through an aperture formed in one wall of the stem 1, and into one of two or more

apertures formed in the stem 3.

As will be seen clearly from Figures 2 and 3, the flat spring 7 is of generally 'V' or 'U' configuration. The pin 6 being secured to the distal end of one arm of the spring 7. The spring 7 is retained in position within the tubular stem 3 in part by the presence of the pin within one of the apertures 8 but mainly by the pressure which its arms exert against the internal wall of the stem 3. Thus, the spring 7 is not physically attached or secured to the wall of the stem 3 or any other part of the coupling.

The shape of the spring 7 will be seen more clearly from Figure 3 of the drawings. The diverging arms 9 of the spring are angled outwardly towards their distal ends to increase the forces exerted by the arms on the stem wall. Typically, for a stem of internal diameter of 28mm, the length of the pin carrying arm approximates to between 50 and 75mm. A preferred length would be approximately 58mm. The width of the spring is typically 6.5mm. The pin is typically 9mm in length and 4mm in diameter and the stem 3 is typically of 140mm, the leading end of reduced external diameter being approximately 35mm in length.

For high temperature applications such as hot felting, the coupling would preferably be produced from a metal (eg. stainless steel). For applications where high temperatures are unlikely to occur, materials such as plastics would be acceptable.

The coupling illustrated and described operates

simply to enable a tool to be releasably connected in a relatively rigid manner to its handle. Thus the spring 7 is positioned within the stem 3 with the pin 6 protruding through the aperture 8. The stem 3 is then slid into the tubular stem 1 to locate the pin 6 within one of the apertures 5, the particular aperture being selected to match as closely as possible the length of the stem. To remove the tool from the handle, this process is reversed. For applications such as applying hot bitumen to roof surfaces, the ability quickly to replace a mop head is important. Also, damage to the spring 7 is likely to occur. In such circumstances, the spring 7 to be replaced is simply removed from the interior of the stem 2 and a fresh spring located in the stem interior.

It will be appreciated that the foregoing is merely exemplary of couplings in accordance with the invention and that modifications can readily be made thereto without departing from the true scope of the invention.

CLAIMS:

1. A coupling for releasably joining together two tubular members in a substantially rigid manner, the dimensions of one such tubular member being such that it can slide within the other tubular member with its external surface in contact with the internal surface of said other tubular member, and a twin-armed spring located within the said one tubular member, one arm of the spring carrying an outwardly extending pin which protrudes through complementary apertures formed in the two tubular members, the arrangement being such that the spring is freely mounted within the said one tubular member and is not physically attached thereto.

2. A coupling as claimed in Claim 1 wherein the spring is of generally "U" or "V" configuration.

3. A coupling as claimed in Claim 1 or Claim 2 wherein said one tubular member is formed with a plurality of apertures each spaced a different distance from its open end and each dimensioned to receive the distal end of the spring-mounted pin.

4. A mop for application of high temperature materials to surfaces, the tubular stems of a head and handle of the mop being dimensioned to allow one to slide within the other and being releasably joined in a substantially rigid manner by a coupling including a twin-armed spring located within one tubular stem, one arm of

the spring carrying an outwardly extending pin which protrudes through complementary apertures in the two stems, the arrangement being such that the spring is freely mounted within one tubular stem and is not physically attached thereto.

5. A mop as claimed in Claim 4 wherein the spring is of generally "U" or "V" configuration.

6. A mop as claimed in Claim 4 or Claim 5 wherein one tubular stem is formed with a plurality of apertures each spaced a different distance from its open end and each dimensioned to receive the distal end of the spring-mounted pin.

7. Apparatus as described herein and as described with reference to Figures 1 to 4 of the accompanying drawings.

Relevant Technical fields

- (i) UK CI (Edition L) B4K (KCE, KJR, KJF, KJG) ;
 F2G
- (ii) Int CI (Edition 5) B25G (3/04, 3/18)

Search Examiner

J A MULLEN

Databases (see over)

- (i) UK Patent Office
- (ii)

Date of Search

26 FEBRUARY 1993

Documents considered relevant following a search in respect of claims 1-7

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2226379 A (SCHMIDT KRANZ & CO)	1, 3
X	GB 1382522 (BAUMGARTEN)	1, 2
X	US 4247216 (PANSINI)	1-6



Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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