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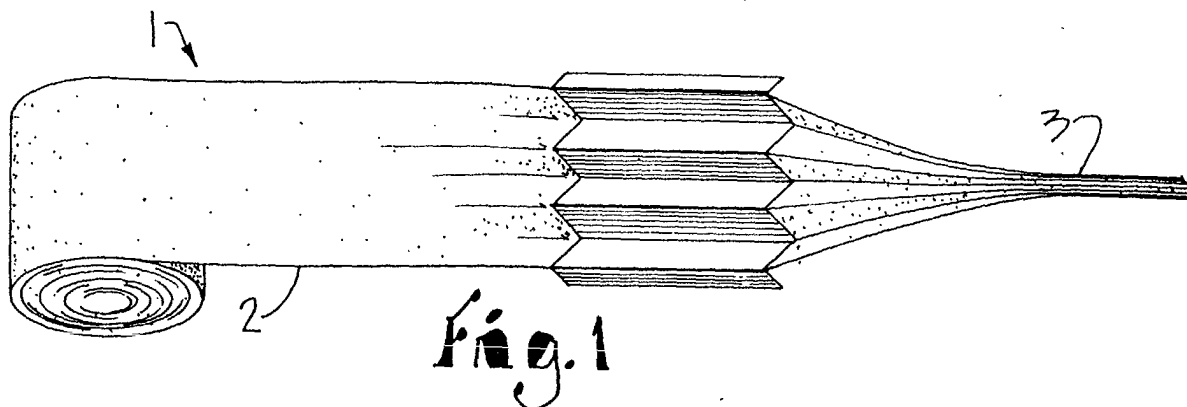
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(54) **Fanfold mop heads**

(57) Disposable and semi-disposable cleaning devices use lengths of fanfold or z-fold non-woven fibre material. These fabrics are an alternative to yarn in the manufacture of inexpensive, disposable and semi-disposable mop heads. A particular embodiment is disclosed wherein a wet mophead or mop swab is made from the disclosed yarn substitute to provide a mop which is priced to discard after one time or several times use depending on the type of material used in the construction process. The mop swab is formed from a length of non-woven, moisture absorbent synthetic fibre material 1 which is folded lengthwise into a continuous

pleated pattern, or fanfold or z-fold arrangement 3. The folded material is wound on a reel from which the material maybe unreeled and run through a mop winding machine which forms helical coils 5 wrapped about a pair of traveling arms 6, 7. Alternatively, the folded material may be fed directly from a folding device to the mop making machine. Sections of the coils 5 are severed in predetermined lengths from the arms 6, 7 and the sections are arranged to provide a head for attachment to a fixture attachable to a mophead and with the remainder of the section falling downwardly in a depending skiff of multiple pleated length strands for mopping contact with a floor.



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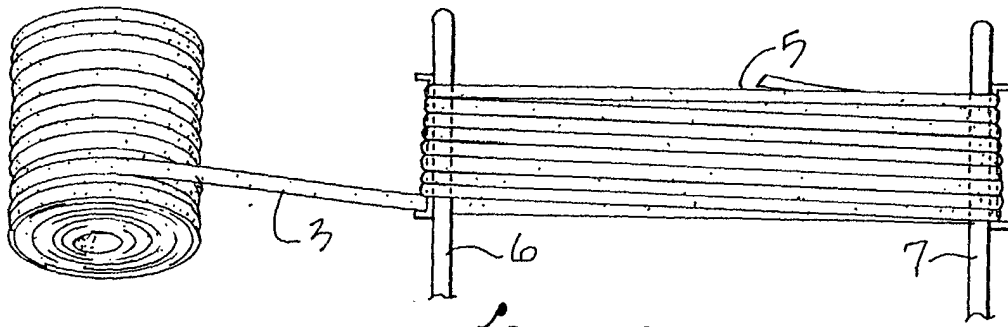


Fig. 2

Description

[0001] This invention relates to cleaning fabrics and materials and a method for making same which uses inexpensive, generally waste or off cut materials with low market value.

[0002] Cleaning devices, mops, wipes and covers have historically been made from cotton or synthetic fibres which are twisted and formed into strands and the strands formed into yarns. The yarns may be woven on looms to produce sheet form goods. These woven fabric articles are made in more or less degrees of cost. An alternative to traditional fibre yarns has been the use of non-woven cellulose/wood pulp fabrics such as used in teabags, food industry machine filters, disposable uniforms, packaging, paper wipes, facial tissue, paper towels and the like. Waste products result from the manufacture of these items. The present invention provides a novel approach to the use of these waste products.

[0003] According to a first aspect of the present invention, there is provided a mop head comprising:

a) a length of non-woven, moisture absorbent synthetic material;

b) said material folded longitudinally into a multiple pleated configuration and formed into a head for attachment to a fixture attachable to a mop handle and with a depending skirt for mopping contact with a floor.

[0004] Preferable and/or optional features of the first aspect of the present invention are set forth in claim 2 and claim 3.

[0005] The z-fold configuration is sometimes termed a "fan fold", "accordion" or "concertina" fold arrangement. The original strip, after being folded in a z-fold configuration is narrowed in width to form a strand which may then substitute for mop strands of conventional configuration. The waste materials used are based on various components mixed with preferably cellulose based non-woven materials which are selected for particular end uses on the basis of differing performance characteristics such as resistance to abrasion, absorbency, longevity and abrasive qualities. The extreme low cost of these materials, previously considered waste trimming and lower end by-products of higher end manufacturing processes, makes feasible a one time or very short time or limited time use for the ultimate purchaser while maintaining an adequate margin for the manufacturer.

[0006] According to a second aspect of the present invention, there is provided a method of making a mop head comprising the steps of:

a) providing a length of non-woven moisture absorbent synthetic material;

b) running the length of material through a folder so as to form multiple pleats to create a pleated strand;

c) wrapping the pleated strand in multiple helical coils about a pair of spaced apart arms;

d) severing sections of the coils in predetermined lengths from the arms; and

e) arranging the sections of the coils so that each has a head for attachment to a fixture attachable to a mop handle and with a depending skirt of the strands for mopping contact with a floor.

[0007] Preferable and/or optional features of the second aspect of the present invention are set forth in claims 5 to 8, inclusive.

[0008] According to a third aspect of the present invention, there is provided a method of making a mopping implement comprising:

a) providing a strip of non-woven moisture absorbent synthetic material;

b) running the strip of material through a folder as to form multiple pleats therein to form a pleated strip;

c) affixing the pleats in the pleated strip so as to make them long lasting, the affixing of the pleats occurring while the strip of material is being folded or in a separate step thereafter;

d) wrapping the pleated strip in multiple helical coils about spaced arms so as to create a length of mop material; and

e) severing the length of mop material into predetermined lengths to create a mopping implement having multiple pleated strips for enhanced mopping contact.

[0009] Many attempts have been made to produce an inexpensive mop which have met varying degrees of success. Some methods have used the cheapest fibres or reclaimed fibres in the spinning process, others have used stacks of fabrics from which strips are cut to form flat ribbons or strings, and yet others have processed non-woven materials using special stretching and twisting techniques which reduce absorbency but add sufficient strength to make a usable mop or other cleaning article. Some are less or more absorbent than others, and some are sturdier than used in others. The instant invention presents a novel solution to the disposable cleaning article and mop problem by providing a strip or ribbon of material which is folded in a "z" configuration. A mop made in accordance with the disclosed process is of such low expense that can be disposed of after a

limited time which may vary from a single day to several weeks. The mop is absorbent yet sufficiently robust to provide effective scrubbing and cleaning ability.

[0010] The invention will now be more particular described, by way of example, with reference to the accompanying drawings, in which :

Fig. 1 is a plan view, partially diagrammatic showing conversion of a strip of non-woven material into a z-folded strip,

Fig. 2 is a plan view, partially diagrammatic showing winding of a strip of z-folded material about the arms of a mop winder machine,

Fig. 3 is a plan view, partially diagrammatic showing a further step in the manufacture of a mop using the z-folded material, and

Fig. 4 is an elevational view of one embodiment of a mop made according to the present invention.

[0011] The reference numeral 1, Fig. 1, generally designates a length of material which forms a yarn substitute for mops. The material 1 is a non-woven, moisture absorbent synthetic material such as used in the manufacture of tea bags, food and industry machine filters, disposable uniforms, packaging, and the like. It is a waste material remaining from the manufacture of such items and are the trimmings or ends of rolls of such material. Such material differs in resistance to abrasion, absorbency, longevity, abrasive qualities and other attributes. Because the material 1 can be put to various purposes as a yarn substitute for mops, the qualities of the material are selected based upon the proposed use of the mop. The material 1 typically comes on a reel on which a length of the material of approximately three to seven inches (7.5 to 18 cms) wide has been wound. A strip 2 of the material is unwound from the reel and passed through a folding machine adapted from such machines for folding wipes or other such articles. The folding machine folds the strip 2 into a series of pleats arranged in a z, accordion or concertina pleated arrangement, such as one would find in a kilt or pleated skirt. Each pleat may be approximately one half to one inch (1.25 to 2.5 cms) in width so that a five inch (12.7 cm) strip 1 would yield a pleated strip 3 of approximately five to ten pleats. The pleated strip 3 may be wound on a reel or run directly into a mop winding machine. Preferably, the pleated strip 3 is treated to affix the pleats, such as by pressing and steaming, pressurized rollers, stitching the pleats in place or by heat sealing the pleats as by ultrasonic welding. The pleats may be affixed while the strip of material is being folded or in a separate step thereafter. Imparting a "memory" into the pleats is important because when the strip 3 is made into a mop or other cleaning implement, maintenance of the pleats provides additional surface contact area between the

material of the mop and the surface to be cleaned.

[0012] The pleated strip 3 may then be formed into a mop. A means of forming a mop is shown in connection with Fig. 2 wherein the pleated strip 3 is run through a mop winding machine and pulled through a winding arm to be wound in a helical coil 5 about spaced arms 6 and 7. The arms 6 and 7 include transport chains which are driven from the rear of the arms and carry the helical coil 5 forwardly as the winding arm revolves around the arms 6 and 7. If the arms 6 and 7 are supported entirely at their rearward ends, the coils 5 fall off the front ends of the arms in a looped relation.

[0013] Alternatively, rotary cutters (not shown) may be placed at the end of the arms 6 and 7 to sever the loops.

[0014] As shown in Fig. 3, a manner of making a wet mop or mop swab from a section 9 of the helical coiled pleated strip 3 is shown in relation to Fig. 3 wherein section 9 is cut medially longitudinally, such as by mechanical cutter wheel and a bail 11 is slipped under the section 9 adjacent the arms 6 and 7. The material contained within the bail 11 comprises the width of a finished mop head as shown in Fig. 4 and a section of the continuous length of helical coil 5 is severed to remove it from the mop forming machine. A mop fixture head 12 is then secured to the bail 11 to form a completed mophead 14. As shown in Fig. 4, the section 9 of pleated strips 3 are somewhat bunched at their head 16 and depend freely downwardly in an inverted u-shaped relationship to form opposite arms that terminate in cut ends 15.

[0015] The mophead 14 may be attached to a mop handle 17 to form a completed wet mop or mop swab.

[0016] The aforementioned pleated strips of non-woven material provides an inexpensive alternative to cotton based twisted yarn products. Such yarn products, when made inexpensively, use short length fibres which are susceptible to linting off of the yarn strand and further subject to rapid deterioration. The alternative pleated strips disclosed herein make mop devices or other cleaning implements of such low cost that they are economically disposable. The non-woven material can be selected to have differing physical properties to suit specific applications including high tensile strength, waterproofness, cleaning power, dirt retention or release, non-linting, oil and grease adherence and the like. Various types of non-woven material from edge trimming waste suitable for use in the present invention range in weight from eighteen to sixty grams per square meter. Suitable range from twenty to fifty percent polypropylene or viscose and up to ten percent cotton. The non-woven types of material suitable for use include the spun lace, hydro entangled, thermal bonded and print bonded.

[0017] The method disclosed above provides an effective and low cost mop or other cleaning implement which lasts at least several times before disposal. These devices are intended to be disposable - they are used several times and then thrown away. The cost is suffi-

ciently low to make disposal cost effective. With particular care and using more durable materials there is no reason why the device could not last longer.

[0018] The invention as described above is not to be limited to the foregoing description except as set forth in the following claims.

Claims

1. A mop head (14) comprising:

a) a length of non-woven, moisture absorbent synthetic material (1);

b) said material (1) folded longitudinally into a multiple pleated configuration (3) and formed into a head (16) for attachment to a fixture (12) attachable to a mop handle (17) and with a depending skirt for mopping contact with a floor.

2. A mop head as claimed in claim 1, wherein the material (1) is formed into a plurality of strands of the multiple pleated configuration (3) which depend from the head (16).

3. A mop head (14) as claimed in claim 1 or claim 2, wherein the material (1) is a single thickness folded into a multiple pleated configuration (3).

4. A method of making a mop head (14) comprising the steps of:

a) providing a length of non-woven moisture absorbent synthetic material (1);

b) running the length of material (1) through a folder so as to form multiple pleats to create a pleated strand (3);

c) wrapping the pleated strand (3) in multiple helical coils (5) about a pair of spaced apart arms (6, 7);

d) severing sections of the coils (5) in predetermined lengths from the arms (6, 7); and

e) arranging the sections of the coils (5) so that each has a head (16) for attachment to a fixture (12) attachable to a mop handle (17) and with a depending skirt of the strands (3) for mopping contact with a floor.

5. A method as claimed in claim 4, wherein the sections of the coils (5) are arranged so that the head (16) is at the portion of the wrapping taken from each of the arms (6, 7) and the wrapping section (9) is cut longitudinally in the center so that two mop

heads (14) are made from each severed section of coiled wrapping.

6. A method as claimed in claim 5, wherein the length of material (1) is in the order of three to seven inches (7.5 to 18 cms) wide and is folded into multiple pleats.

7. A method as claimed in claim 5 or claim 6, including the step of forming a reel of the pleated strand (3) and unreeling the reel during the step of wrapping.

8. A method as claimed in any one of claims 5 to 7, wherein the sections of severed coils (5) are gathered in a longitudinal middle to form the head (16) for attachment to the mop fixture (12), with the strands (3) depending therefrom.

9. A method of making a mopping implement comprising:

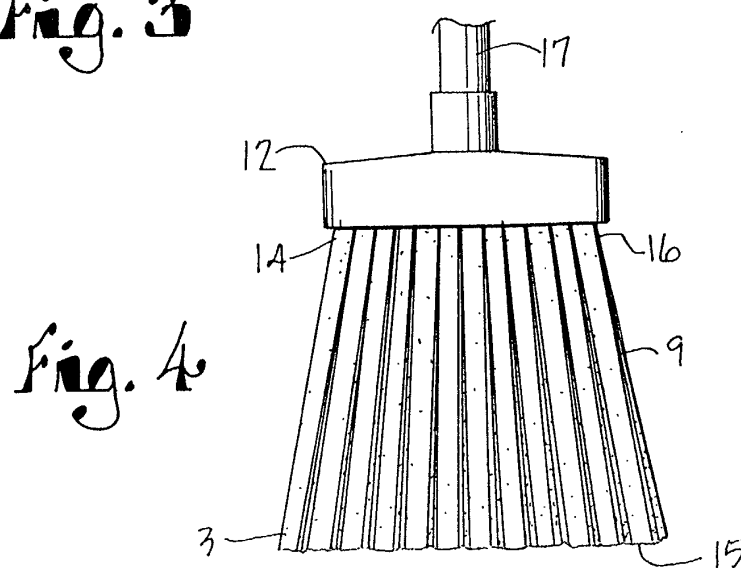
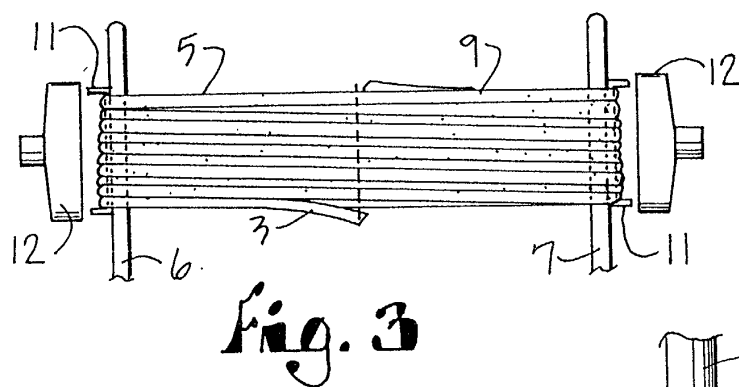
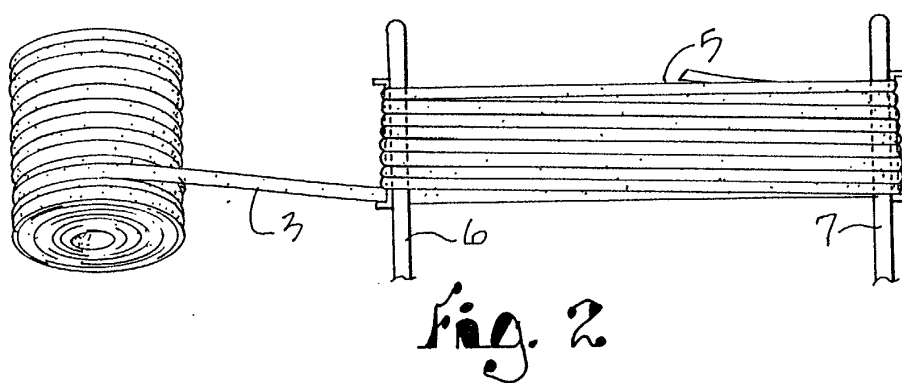
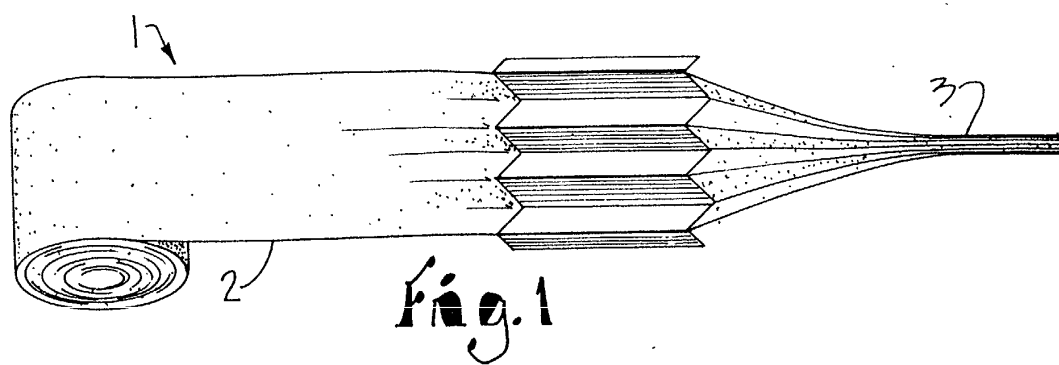
a) providing a strip (2) of non-woven moisture absorbent synthetic material (1);

b) running the strip (2) of material (1) through a folder as to form multiple pleats therein to form a pleated strip (3);

c) affixing the pleats in the pleated strip (3) so as to make them long lasting, the affixing of the pleats occurring while the strip (2) of material (1) is being folded or in a separate step thereafter;

d) wrapping the pleated strip (3) in multiple helical coils (5) about spaced arms (6, 7) so as to create a length of mop material; and

e) severing the length of mop material (1) into predetermined lengths to create a mopping implement having multiple pleated strips (3) for enhanced mopping contact.





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EUROPEAN SEARCH REPORT

Application Number
EP 02 25 0348

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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Place of search THE HAGUE		Date of completion of the search 26 February 2003	Examiner MUNZER, E
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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