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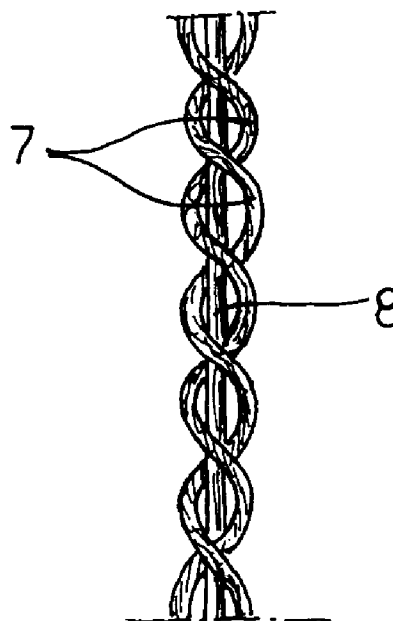
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**(54) Synthetic-yarn door-mat and manufacturing method thereof**

(57) A door-mat (1) formed by a yarn woven onto a base support (2) wherein the yarn comprises a polypropylene thread (7) coupled with a stiffening core formed by a single nylon filament (8). The yarn composition provides to the door-mat (1) improved resilience and wear resistance performance, while ensuring a prompt lifting up of the trampling areas thereof back to the undeformed condition.

*Fig. 3*



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## Description

The present invention is generally related to door-mats and manufacturing thereof.

Traditionally, these articles are produced by interlacing vegetable fibres together, or with a synthetic yarn woven onto a base support, or with moulded rubber compounds or plastic materials (PVC etc.).

More recently, door-mats have been produced and marketed whose synthetic yarn comprises a polypropylene thread, providing advantages in terms of better resistance and life term.

The object of the present invention is to improve the above door-mats formed with a synthetic yarn, and more particularly to further enhance the strength, resilience and wear resistance characteristics thereof, while providing complete anti-slip performance and easy cleaning capability even in a washing machine.

According to the invention, this object is achieved by the fact that the polypropylene thread is coupled with a stiffening core formed by a nylon filament.

Preferably the yarn is formed by two ends of a polypropylene thread wound together by twisting with opposite twist directions over a single nylon filament and thermally fixed thereto.

By virtue of this idea of solution, the door-mat according to the invention is capable to ensure in the time optimum resilience and wear resistance performances.

The stiffening core formed by the single nylon filament further ensures a prompt elastic lifting up of the door-mat trampling areas, thus reducing the formation of non aesthetical foot prints. Moreover mixing together two fibers having opposite electrostatic charges, positive for nylon and negative for polypropylene, provides the door-mat according to the invention with a permanent anti-statical behaviour.

The invention is also directed to a method for the manufacturing of the door-mat set forth in the above.

The invention will now be disclosed in detail with reference to the accompanying drawings, purely provided by way of non limiting example, in which:

- figure 1 is a diagrammatic perspective view of a door-mat according to the invention,
- figure 2 is a simplified and enlarged cross-sectional view of a portion of the door-mat, and
- figure 3 shows in an enlarged scale a detail of figure 2.

In the drawings, reference numeral 1 generally designates a door-mat according to the invention, constituted by a base support 2 and a pile layer 3, of a usual height.

The base support 2 is formed by a weave cloth 4, normally made of T.N.T. polyester or polypropylene, joined to a synthetic jute wound underlay 5 by a particular rubber latex compounds on the underlining surface of which an embossed pattern is impressed for anti-slip

purposes.

The door-mat 1 is further provided with an outer finish comprised of a perimetral skirt made of a continuous ribbon 6, having the same colouring as the door-mat yarn and also made of T.N.T. polyester, thermally fixed at the end of its perimeter.

The pile layer 3 is formed by a yarn, woven onto the cloth 4 of the base support 2, which according to the invention comprises a polypropylene thread coupled with a stiffening core formed by a nylon filament.

More particularly, the yarn is constituted by two ends of continuous, bulked and ingrained BCF polypropylene thread 7, and by two ends of a single nylon 66 filament 8. Normally the amount of the polypropylene thread 7 is around 78% by weight, and that of the single nylon filament 8 is around 22% by weight of the yarn.

Production of the yarn disclosed in the above is performed as follows.

Firstly, initial coupling of each end of the polypropylene thread 7 with the single nylon filament 8 is carried out. Then kinking of the polypropylene thread 7 over the single nylon filament 8 is performed, by means of a double-twisting machine, i.e. in opposite twist directions as diagrammatically depicted in figure 3, so as to obtain a balanced twisting of the single ends of the thread 7. Lastly fixing between the thread 7 and the filament 8 is performed by thermal action, normally through a continuous tunnel heat-set treatment.

Weaving of the yarn thus constituted by the polypropylene thread 7 and the nylon filament 8 is then carried out on a particular tufting loom, of the type conventionally known as "full wide repeat scroll tufting machine", capable to obtain multiple colour patterns, as well as to produce, if desired, an uneven eight surface of the pile 3. By differentiating the weaving height with terry and pile it is in practice possible to "engrave" the trampling surface of the door-mat 1, so as to create for instance channels intended to facilitate shoe cleaning and discharge of powder, loam etc.

Due to this weaving technique, a refinement appearance is achieved thus completing and enriching the function of the door-mat according to the invention, which is not only confined to cleaning but also provides a fitting-up complementary effect.

The further manufacturing and finishing steps of the door-mat 1 are substantially conventional.

Due to the provision of the single nylon filament 8, the door-mat according to the invention is provided with remarkable resilience and wear resistance characteristics, along with an immediate lift up performance of the trampling areas thereof back to the undeformed condition.

Moreover the door-mat according to the invention has permanent anti-static and anti-slipping characteristics, and is adapted to be easily cleaned even by means of a washing machine.

Naturally, the details of construction and the embodiments may be widely varied with respect to what has been disclosed and illustrated, without thereby

departing from the scope of the present invention, such as defined in the appended claims.

## Claims

1. Door-mat (1) comprising a yarn woven onto a base support (2), wherein the yarn comprises a polypropylene thread (7), characterized in that the polypropylene (7) thread is coupled with a stiffening core formed by a nylon filament (8). 5 10
2. Door-mat according to claim 1, characterized in that the yarn is formed by two ends of a polypropylene thread (7) wound together by twisting with opposite twist directions over a single nylon filament (8) and thermally fixed thereto. 15
3. Door-mat according to claim 1 or claim 2, characterized in that said polypropylene yarn (7) and said nylon filament (8) consist of about 78% and about 22% by weight of the yarn, respectively. 20
4. Method for the manufacturing of a door-mat (1) by weaving a yarn onto a base support (2), wherein said yarn comprises a polypropylene thread (7), characterized in that the polypropylene thread (7) is coupled with a stiffening core formed by a nylon filament (8). 25
5. Method according to claim 4, characterized in that the yarn is produced according to the following steps: 30
  - providing two ends of polypropylene thread (7) and a single nylon filament (8), 35
  - coupling said two ends of the polypropylene thread (7) with said single nylon filament (8),
  - winding together the ends of the polypropylene thread (7) over the single nylon filament (8) by twisting said ends in opposite directions, 40
  - thermally fixing together said polypropylene thread (7) and said single nylon filament (8).
6. Method according to claim 4 or claim 5, characterized in that said polypropylene thread (7) and said nylon filament (8) consist of about 78% and about 22% by weight of the yarn, respectively. 45
7. Method according to any of claims 4 through 6, characterized in that weaving of the yarn onto said base support (2) is carried out by means of a full wide repeat scroll tufting system. 50

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Fig. 1

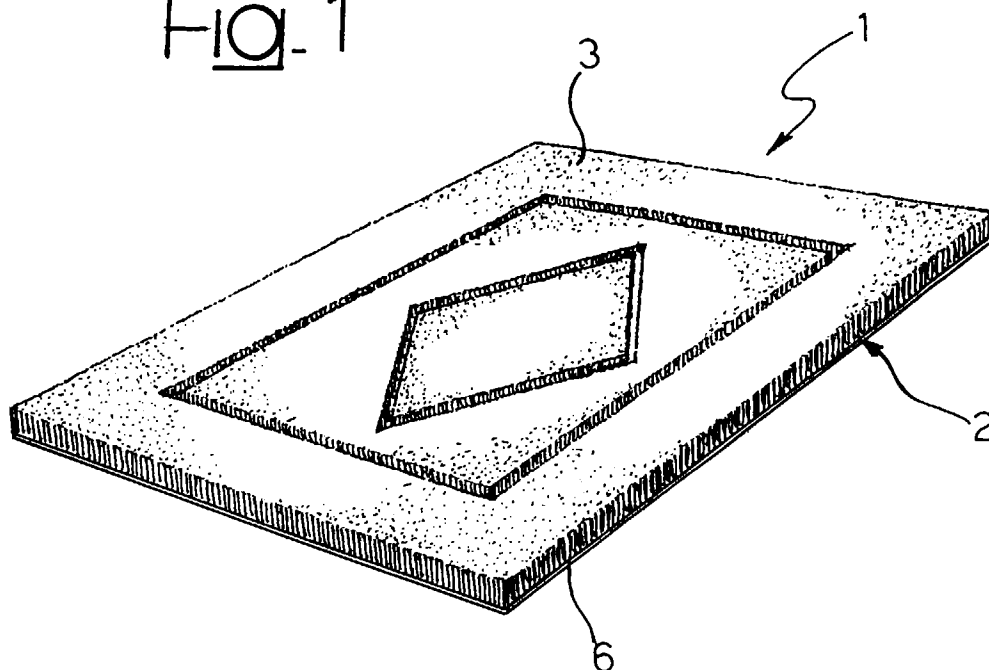


Fig. 2

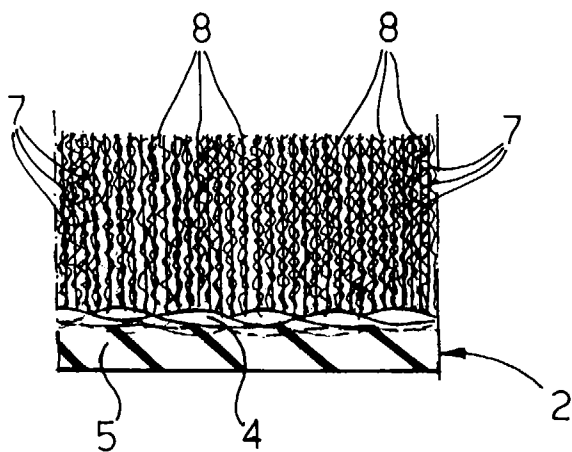


Fig. 3

