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⑤④ **Offset rubber blankets and method for the manufacture thereof.**

⑤⑦ There is presented an offset rubber blanket, comprising a carcass possessing at least one cord ply of a thickness of 0.5 to 0.7 mm, coated on both sides with rubber dough at a thickness, which is at least equal to the thickness of one cord thread.

The proposed offset rubber blankets excell by relatively high strengths and reduced stretches and may also be conceived as compressible blankets.

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## OFFSET RUBBER BLANKETS AND METHOD FOR THE MANUFACTURE THEREOF

The present invention relates to a novel offset rubber blanket and to a method for the manufacture thereof.

According to the specifications of the institution FOGRA, of Streitfeldstr. 19, 8000 München 80, performing quality control tests on offset blankets, the loading of 250 N/cm on these articles should not result in a stretching exceeding 3 %, whereas their rupture strength ought to be at least 750 N/cm.

The aim of the further development of offset rubber blankets is to improve said required properties, i.e. to achieve a minimum stretching, by means of novel materials and novel technological procedures and, at the same time, to rationalize production.

Therefore there has been a need for novel offset rubber blankets which would fulfil these requirements as well as for a new, technologically advantageous and economical method for the manufacture thereof.

The carcass of a classical type offset blanket of a thickness of 1.60 to 1.95 mm is made up of two to three plies of rubber lined textile fabric. These fabrics are made of special cotton or cellulose fibres of various weft yarn and warp thread structure, which have to be tensioned already during the manufacturing process in order to ensure a minimum stretching of the article in the final phase.

It is evident from the information concerning the trends in offset rubber blankets research that the manufacturers have been suggesting various new solutions for achieving a reduced stretching of said blankets.

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In German patent 20 25 547 there is described a carcass for an offset rubber blanket consisting of at least one ply of fabric on the basis of regenerated cellulose with a weft-stretch of 1.5 to 4 % and a warp-stretch of 3 to 6 %.

In the German Offenlegungsschrift 28 16 703 there is described the pre-tensioning of a carcass made of two plies of fabric, whereby a stretching of 0.2 to 1.3 % is achieved under a load of 100 to 200 N/cm.

In German patent 25 55 233 there is represented a carcass comprising steel foil, steel wire or steel net.

The above-cited German patent 20 25 547 and German Offenlegungsschrift 28 16 703 do not essentially alter the gist of the existing state of art concerning the manufacture of offset rubber blankets. The German patent 20 25 547 teaches the replacement of the fabric raw material in order to produce similar textile fabrics which are adapted to the required strength of the article, whereas the basic technology of the manufacture of offset blankets remains unaltered.

The German Offenlegungsschrift 28 16 703 introduces an additional pre-tensioning of the carcass into the existing manufacturing process, which in fact means an additional technical step in the existing manufacturing process.

German patent 25 55 233 brings an essential change in the choice of the carcass, it is, however, silent on the technical solutions permitting the performance thereof.

Although the suggested solutions for achieving the non-stretching of the carcass are interesting, there are questionable the manufacturing technology and the performance of the so produced blankets during their handling, cutting as well as mounting on the printing machine and printing.

Offset blankets disclosed in the following text and made in accordance with the present claimed process have not been disclosed yet as far as we know, so we presume them to be novel.

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In accordance with the present invention there are presented a novel offset rubber blanket with improved characteristics and, as a further object of the present invention, a new process for the manufacture thereof, performed in a technically feasible, simple and economical way.

The inventive feature of the novel offset rubber blanket resides in that its carcass comprises at least one cord ply of a thickness of 0.2 to 1.6 mm, most suitably of 0.5 to 0.7 mm, coated on both sides with rubber mixture to a thickness, which is at least equal to the diameter of one cord thread.

The cord ply comprises cord threads, rubber-coated on both sides and carrying in longitudinal direction, without cross-bonding or with a cross-bonding ensuring only a constant distance of 20 to 40 mm between the individual cord threads, without any special strength requirements.

The rubber coating of the cord ply may be performed on machines usual in rubber processing in accordance with the doubling, calendering or spraying principles or combinations thereof resp., under conditions depending on the chosen technology and the used rubber material.

According to the technique of rubber coating on a four-roll calender, the rubber coating of the cord ply is performed with a dough on the basis of the NBR-elastomer at a temperature of 337 K to 373 K and at rates of 10 m/min to 20 m/min.

Each cord thread is made up of one or more intertwisted primary filaments, pre-formed from single filaments.

The advantage of cord threads in comparison with textile fabrics consists in the achievement of a minor stretching at relatively high strengths, which is especially attained by means of a lower degree of twist in the single and primary filaments resp.

The cross-bonding of cord threads is only needed when the machines for the rubber coating of the cord ply are not equipped

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with means for the guiding and tensioning of each single cord thread. As cord plies there may be used materials which will impart the required properties to the carcass in the offset rubber blanket and they comprise cords suitably twisted from filaments such as e.g. rayon cord, glass fibre cord, aramide fibre (Kevlar<sup>R</sup>) cord, steel cord and the like.

The breaking strengths of single cord threads of a diameter of 0.5 mm are within the range of 100 N/thread (for glass cord) to 400 N/thread and even more (for steel cord and aramide (Kevlar<sup>R</sup> resp.).

The rubber materials should correspond to the required characteristics of the final product with respect to the resistance against chemicals and the bonding of the components.

To the action of chemicals and printing inks and solvents, there is especially exposed the face of the blanket, the so-called rubber finish, which transfers the ink from the printing form to the stock, e.g. paper.

During the printing, the offset rubber blanket is also subjected to compressive stresses, consequently, the intermediate rubber layers and the carcass materials should possess a high elasticity and strength.

In order to further improve the compressibility characteristics of the present blankets as required for special uses, one or both side, preferably the face rubber, may be coated with rubber dough, which, after the performed vulcanization, yields a cell (porous) structure of the vulcanisate.

In practice this might be performed if e.g. into the rubber dough used for the rubber-coating of the chosen surface for the cord ply, there are introduced 1 to 5 % of a blowing up agent, e.g. azodicarbonyl amide, which, during the vulcanization process, is decomposed to gaseous products as nitrogen, which impart a porous cell structure to the vulcanizate.

Without any substantial modification or additional costs, thus can be obtained offset rubber blankets with highly improved

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compressibility characteristics, which is a particular advantage with respect to hitherto known classical methods.

The present inventive offset rubber blanket is represented in cross-section in the enclosed drawing, wherein there represent:

- 1 - the bottom layer consisting of textile fabric, rubber-coated on the surface adhering to the carcass,
- 2 - the carcass comprising a cord ply, rubber-coated on both sides,
- 3 - the intermediate layer consisting of textile fabric, rubber-coated on both sides,
- 4 - the face of the blanket,
- 5 - the optional porous (cell) vulcanized rubber layer.

In accordance with the present claimed process there is first prepared the carcass, which is laminated with other elements represented in the enclosed drawing, whereupon the vulcanization is performed at conditions corresponding to the composition of the rubber in the offset rubber blanket.

In the following text the inventive process is illustrated on the basis of a working Example, which, however, is not to be construed as limitative and excluding modifications with other or different cord materials in the carcass as well as various constructions of the offset blankets.

Concerning various constructions of offset rubber blankets, the Applicant does not exclude even constructions comprising only the carcass (2) and the face (4), omitting the rubber-coated fabric plies (1) and (3), especially (3).

It is understood that the layer (5) is optional as well.

Example

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The carcass was manufactured from a ply of rayon cord 1840/2 of a density of 1200 thread/m. produced by Viskoza, Loznica, Yugoslavia, possessing a thread thickness of 0.70 mm. a rupture strength of 150 N/thread and a stretch of 1.4 to 2.5 % under a stress of 45 N/thread.

The ply was spread on either side with a rubber coat of a thickness of 0.90 mm by means of a four-roll calender.

The rubber-coated cord ply was used in the construction of the offset rubber blanket, comprising the layers which are shown in the already discussed enclosed drawing (with the exception of (5)).

The superimposed layers were vulcanized in a laboratory press for 20 minutes at a temperature of 433 K.

The rubber blanket manufactured in the above manner showed a stretch of less than 1 % under a stress of 250 N/thread and a rupture strength exceeding 1000 N/cm in the lengthwise (warp) direction of the cord threads.

CLAIMS

1. An offset rubber blanket, characterized in that it comprises a carcass consisting of at least one cord ply of a thickness of 0.2 to 1.6 mm, most suitably of 0.5 to 0.7 mm, which is coated on both sides with rubber dough at a thickness which is at least equal to the thickness of one cord thread.
2. Process for the manufacture of an offset rubber blanket, characterized in that a composite structure, comprising a bottom layer (1), made up of textile fabric and rubber-coated on the surface adhering to the carcass, a carcass (2) made up of a cord ply, rubber-coated on both sides, an intermediate layer (3) made up of textile fabric rubber-coated on both sides, a rubber face (4) and a porous rubber layer (5), the layers (1), (3) and (5) being optional, is subjected to vulcanization.

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