MAGNETIZED PRINTING BLANKET

12 Claims, 3 Drawing Figs.

ABSTRACT: A magnetized flexible printing blanket adapted to be self-attached to an associated unmagnetized support comprised of a ferrous material, wherein said blanket comprises an outer ink-receiving layer and an inner layer having a matrix of a rubberlike material and said matrix has a plurality of finely divided particles of magnet material embedded in it to provide optimum flexibility for said blanket.
MAGNETIZED PRINTING BLANKET

BACKGROUND OF THE INVENTION

Many offset printing machines are in current use which utilize flexible printing blankets, or the like, which must be attached to associated printing cylinders. The printing blankets proposed heretofore are either very expensive to produce or require printing cylinders and associated holding devices of complicated and expensive construction in order to hold such previously proposed printing blankets in position.

SUMMARY

This invention provides a magnetized flexible printing blanket of simple and economical construction which is adapted to be self-attached to an associated printing cylinder of simple construction and which is also readily usable on existing or standard printing cylinders without requiring special installation techniques, adapter kits, fastening devices, or the like.

Other details, uses, and advantages of this invention will become apparent as the following description of the exemplary embodiments thereof presented in the accompanying drawing proceeds.

BRIEF DESCRIPTION OF THE DRAWING

The accompanying drawing shows present exemplary embodiments of this invention, in which

FIG. 1 is a perspective view illustrating by solid lines one exemplary embodiment of the printing blanket of this invention arranged above an associated printing cylinder and illustrating by dotted lines the printing blanket wrapped around and self-attached against such cylinder;

FIG. 2 is a greatly enlarged fragmentary cross-sectional view taken on the line 2—2 of FIG. 1; and

FIG. 3 is a perspective view illustrating another exemplary embodiment of a magnetized printing blanket of this invention wrapped and self-attached in position against a typical printing cylinder which is in current use and illustrating portions of such printing blanket broken away.

DESCRIPTION OF ILLUSTRATED EMBODIMENTS

Reference is now made to FIG. 1 of the drawings wherein one exemplary embodiment of a magnetized flexible printing blanket of this invention is illustrated and designated generally by the reference numeral 10.

The printing blanket 10 is particularly adapted to be self-attached against an associated support which in this example is in the form of a printing cylinder 11 and has a substantially right circular cylindrical supporting surface 12 comprised of an unmagnetized ferrous material. The cylinder 11 has a central shaft 13 extending from opposite ends thereof and the shaft 13 is adapted to rotateably support the cylinder 11 and printing blanket 10 in position on an associated printing machine and for a purpose which is well known in the art.

The printing blanket 10 has a permanent magnet material provided as an integral part thereof which enables such blanket to be magnetically self-attached against its associated printing cylinder 11 and as will be described in more detail subsequently; yet, the blanket 10 has optimum flexibility and is easily wrapped around the printing cylinder 11 from the solid line position illustrated at 14 to the dotted line position illustrated at 15 in FIG. 1, and the permanent magnet material assures that such blanket is firmly attached and remains firmly held in the dotted line position illustrated even after prolonged use of the printing blanket 10.

As will be apparent from FIG. 2 of the drawings, the blanket 10 is comprised of an outer ink-receiving layer 20, an inner layer 21, and an intermediate layer 22 arranged between the ink-receiving layer 20 and the inner layer 21. The intermediate layer 22 is in the form of a binding and load-carrying layer and serves to bind the outer ink-receiving layer 20 and the inner layer 21 together so that the blanket 10 has high structural strength and is formed essentially as one integral unit.

The outer or ink-receiving layer 20 of the printing blanket 10 may be made of any suitable known material including natural rubber, synthetic rubber, polyurethane, and the like, in a manner well known in the art. Thus, a more detailed description of the outer layer 20 will not be presented.

The intermediate or binding layer 22 may be comprised of a high-strength woven fabric 23 which may be suitably impregnated with a conventional rubberlike material 24. The constituents of the layer 22 are selected as required to assure that the printing blanket has the desired structural characteristics.

The inner layer 21 of the exemplary printing blanket 10 of this invention has the permanent magnet material provided as an integral part thereof and the layer 21 is formed as the innermost layer of the blanket 10, i.e., inner and innermost being determined with the blanket 10 self-attached in position against its associated printing cylinder 11. However, it will be appreciated that the layer 21 need not necessarily be the innermost layer of a particular printing blanket similar to the blanket 10 and the layer 21 may be arranged closely adjacent the innermost layer of the particular printing blanket with the permanent magnet material in the layer 21 still providing the self-attaching feature.

The inner layer 21 is comprised of a matrix 25 within which the permanent magnet material is embedded. Any suitable magnetized material may be utilized which assures that the printing blanket 10 may be self-attached to an associated structure and which assures that such blanket has optimum flexibility such as in an infinite number of mutually perpendicular planes arranged transverse the blanket 10 with such blanket arranged in one plane, for example.

The permanent magnet material may be comprised of a plurality of finely divided particles 26. These particles may be barium ferrite, or similar magnetizable particles, and such particles having a size generally of the order of 200 mesh have been successfully utilized to make a printing blanket 10 having optimum holding strength and improved flexibility. The reference to 200 mesh barium ferrite particles refers to particles capable of being passed through a 200 mesh screen.

The matrix 25 comprising the inner layer 21 may be comprised of any suitable rubberlike material such as natural or synthetic rubber together with the usual associated constituents such as fillers, accelerators, activators, antioxidants, softeners, plasticizers, vulcanizing agents, etc., and as well known in the art. Therefore, a detailed presentation of the particular specific constituents which may be utilized and their relative quantities will not be presented in detail.

In general, the matrix may be comprised of 100 parts by weight of rubber plus 50 parts or less by weight of selected ones of the usual associated constituents mentioned above. Further, it should be mentioned that the particular amounts of the associated constituents may be varied depending upon the characteristics desired for the particular matrix 25. With this understanding that 100 parts by weight of rubber may be utilized in the matrix 25, the detailed description will now proceed with a discussion of the weight of particles 26 such as magnetized particles of barium ferrite which have been found by test to provide the best results for a printing blanket.

In particular, it has been found that when the particles 26 embedded in the matrix 25 have a total weight which ranges between approximately 8 times greater to 15 times greater than the weight of the rubber comprising the matrix 25 the inner layer 21 and hence the resulting printing blanket 10 has high integral holding strength and the magnetized particles do not appreciably diminish the flexibility of the printing blanket 10. Thus, for a given printing blanket 10 anywhere from 800 parts to 1,500 parts of barium ferrite particles may be used with the 100 parts of rubber. This concept of weight ratios may be otherwise expressed by stating that the particles 26 embedded in the matrix 25 and the rubber or rubberlike material comprising the matrix 25 may have approximate weight ratios ranging between 8/1 and 15/1 respectively.
The printing blanket 10 may be made of any suitable thickness depending upon the application in which such blanket is to be used. One typical size blanket which has been successfully used has an inner layer 21 which is 0.010 inch thick, a binding layer 22 which is 0.020 inch thick, and an ink-receiving layer 20 which is 0.015 inch thick, whereby the total overal thickness of such blanket is 0.045 inch.

It has also been found that for a 0.045-inch thick printing blanket 10 in which the weight of the magnetized particles 26 in the matrix 25 when compared to the weight of the rubber used to form such matrix 25 has a ratio of 15/1 respectively, best results are provided by keeping the inner layer 21 roughly 0.010 inch thick, whereby such inner layer 21 has a thickness which is roughly 22 percent of the total thickness of the blanket 10. Similarly, in the case of the printing blanket 0.045 inch thick wherein the total weight of the magnetized particles 26 compared to the weight of the rubber in the matrix 25 have a ratio of 8/1 respectively, best results are provided by keeping the inner layer 21 roughly 0.015 inch thick, whereby such inner layer 21 has a thickness which is roughly 33 percent of the total thickness of the blanket 10. Thus, for a given number of parts of rubber in the matrix 25 (100 parts, for example) and with the overall thickness of the blanket 10 kept at a given value, decreasing the thickness of the layer 21 as the weight of the magnetized particles is increased when compared to the weight of the rubber in the matrix 25 assures that the overall resiliency of the printing blanket 10 is maintained within acceptable limits.

However, it will be appreciated that printing blankets of various thicknesses are used in the printing industry. For example, a typical three-ply blanket may be approximately 0.065 inch thick and a typical four-ply blanket may be approximately 0.075 inch thick. For these blankets of various thicknesses, the integral layers in each instance may be dimensioned as desired and preferably so that the inner layer containing the magnetized particles 26 has a thickness ranging between 22 percent and 33 percent of the total thickness of the blanket 10 and preferably such thickness is kept at roughly 25 percent of the total thickness of the blanket 10.

Each of the permanently magnetized particles in the inner layer 21 exerts an effective holding force irrespective of its position in such inner layer. Further, because only a maximum of approximately 78 percent of the thickness of the blanket 10 may be arranged outwardly of the inner layer 21 with maximum tendency, the blanket 10 arranged in one plane, for example, for the ink-receiving layer 20 to be displaced substantially in a plane parallel to the plane of the inner layer 21, whereby the printing produced using the blanket 10 of this invention is of superior quality. Any exemplified embodiment of this invention is illustrated in FIG. 3 of the drawing. The printing blanket illustrated in FIG. 3 is practically identical to the blanket 10; therefore, such blanket will be designated generally by the reference numeral 10A and each of its component layers will also be designated by the same reference numeral as previously also followed by the letter designation A and not described in detail. It will also be appreciated that the constituents of the various component layers are substantially identical to the constituents of the component layers of the printing blanket 10 and reference may be made to the previous description as desired.

The blanket 10A is particularly adapted to be installed in position on an associated printing cylinder 30A of standard construction which has a central shaft 31A extending from its opposite ends and which is adapted to rotatably support the cylinder 30A in position on an associated printing machine in a known manner. The printing cylinder 30A has an outer cylindrical surface comprised of an unmagnetized ferrous material and is of the type which has a recess indicated at 32A within which an associated fastening device 33A, indicated by dotted lines, is normally carried as part of the cylinder 30A and used to fasten a printing blanket of conventional construction in position on the printing cylinder 30A.

The unique printing blanket construction of this invention has optimum versatility and because of the magnetized particles embedded in one of its inner layers is readily self-attached in position on the standard printing cylinder 30A merely by wrapping the blanket 10A in position against the outer cylindrical surface of the printing cylinder 30A. The printing blanket 10A is dimensioned so that it may be wrapped substantially completely around the outer surface of the printing cylinder 30A leaving a space indicated at 34A between its opposite ends and with its opposite ends arranged adjacent opposite sides of the recess 32A provided in the printing cylinder 30A.

The printing blanket 10A is readily installed in position on a printing cylinder of standard construction, such as the cylinder 30A, without requiring special fastening devices, installation tools, techniques, or skills on the part of the installing personnel. For example, it is merely necessary to align an edge portion 35A adjacent one side edge portion of the recess 32A on which the flexible blanket 10A may then be simply wrapped in a self-attaching manner around the outer circumference of a cylinder 30A and remains firmly self-attached.

The opposite end edges of the exemplary printing blanket 10A are shown as extending substantially perpendicularly to the outer side surface of the printing blanket. However, it will be appreciated that the unique printing blanket 10A of this invention may have each of its end edges arranged to extend at an angle relative to its outer side surface as indicated by dotted lines at 36A whereby there would be minimum likelihood that the spaced end edges of the blanket 10A would have objects snagged thereagainst.

While present exemplary embodiments of this invention have been illustrated and described, it will be recognized that this invention may be otherwise variously embodied and practiced within the scope of the following claims. What is claimed is:

1. A magnetized printing blanket comprising an outer ink-receiving layer and an inner layer having a matrix and a permanent magnet material embedded in said matrix, said permanent magnet material being adapted to hold said printing blanket in a nonslipping manner on an associated support comprised of a ferrous material.

2. A printing blanket as set forth in claim 1 wherein said permanent magnet material is comprised of a plurality of finely divided particles embedded in said matrix so as to provide optimum flexibility for said blanket.

3. A printing blanket as set forth in claim 2 in which said matrix is comprised of a rubberlike material and said particles and rubberlike material have approximate weight ratios ranging between 8/1 and 15/1 respectively.

4. A printing blanket as set forth in claim 2 in which said inner layer defines the innermost layer thereof and further comprising a binding layer arranged between said outer layer and said innermost layer.

5. A printing blanket as set forth in claim 2 in which said permanent magnet material comprises particles of barium ferrite having a size generally of the order of 200 mesh.

6. A printing blanket as set forth in claim 4 in which said innermost layer has a thickness which is roughly 25 percent of the total thickness of said blanket.

7. A printing blanket as set forth in claim 4 in which said innermost layer has a thickness ranging between 22 percent and 33 percent of the total thickness of said blanket.

8. A magnetized flexible printing blanket particularly adapted to be self-attached against a substantially cylindrical printing cylinder comprised of a ferrous material, said blanket comprising an outer ink-receiving layer and an inner self-attaching layer having a matrix and a plurality of finely divided permanent magnet material embedded in said matrix, said material being adapted to self-attach and hold said printing blanket against said cylinder in a nonslipping manner while providing optimum flexibility therefor.

9. A printing blanket as set forth in claim 8 in which said inner layer defines the innermost layer thereof, and further
comprising a binding layer arranged between said outer layer and said innermost layer.

10. A printing blanket as set forth in claim 8 in which said matrix is comprised of a rubberlike material and said permanent magnet material and rubberlike material have approximate weight ratios ranging between 8/1 and 15/1 respectively.

11. A printing blanket as set forth in claim 10 in which said inner self-attaching layer has a thickness which is roughly 25 percent of the total thickness of said blanket with said permanent magnet material exerting an effective holding force irrespective of their relative positions in said inner layer.

12. A printing blanket as set forth in claim 10 in which said inner self-attaching layer defines the innermost layer thereof and has a thickness ranging between 22 percent and 33 percent of the total thickness of said blanket, with said permanent magnet material exerting an effective holding force irrespective of their relative positions in said innermost layer, and further comprising a binding layer comprised of a high-strength fabric arranged between said outer layer and said innermost layer.