

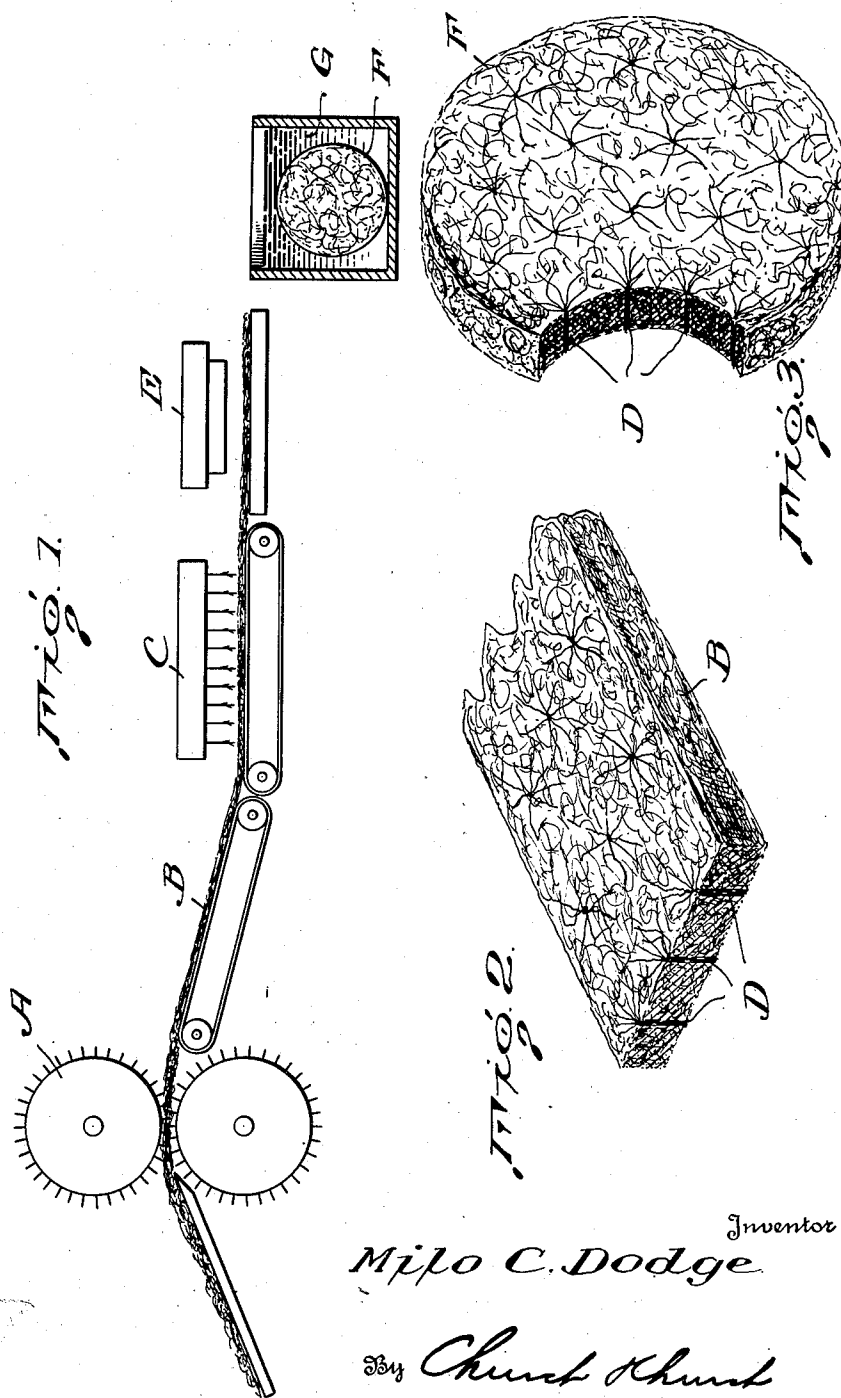
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M. C. DODGE

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MOLDABLE PLASTIC COMPOSITION

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Inventor
Milo C. Dodge

By *Chas. K. Hunt*

His Attorneys

UNITED STATES PATENT OFFICE

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MOLDABLE PLASTIC COMPOSITION

Milo C. Dodge, Auburn, N. Y., assignor to Columbian Rope Company, Auburn, N. Y., a corporation of New York

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5 Claims. (Cl. 18—47.5)

This invention relates to improvements in molded plastic bodies and, particularly, to the filler material used in producing such bodies.

Various woven materials have heretofore been used as a filler for molded plastics and one object of the present invention is to provide a much less expensive filler material which can be used with the same facility as said woven materials and which will not appreciably affect the characteristics or properties required of a high quality molded plastic body.

It has also heretofore been proposed to use a filler of loose fibers which are promiscuously deposited in the mold in forming the molded body and, to increase the resistance of the molded body to breaking strains, it has been further proposed to use substantially parallel fibers in sliver formation as a filler. These forms of filler, however, are rather bulky in the mold and a further object of the invention is to provide a filler material which will be less bulky.

A still further object is to provide a filler material in the form of a more or less compacted body which will facilitate handling thereof both in the impregnating thereof with the binder and in the loading thereof in the mold. The compactness of the present filler also permits the die-clicking therefrom of portion shaped to conform to the mold.

Another object is to provide a filler which, while rather compact, is at the same time readily impregnated with the binder. More specifically, the filler material is composed of a mass of stapled fibers, preferably vegetable fibers, which have been reduced to web-like form in a carding machine and then subjected to a needling or gigging action wherein a plurality of barbed needles are projected and retracted through the web to pull small groups or tufts of fibers through the web. These tufts or groups of fibers extending through the web serve, primarily, to interlock the fibrous mass and render the mass more compact but the needles leave minute voids in the web which, of course, aid in permitting the binder solution gaining access to the interior of the mass.

With these and other objects in view, the invention consists in certain details of construction and combinations and arrangements of parts, all as will hereinafter be more fully described and the novel features thereof particularly pointed out in the appended claims.

In the accompanying drawing—

Figure 1 is a side elevation illustrating more or

less diagrammatically the apparatus for producing the filler material;

Fig. 2 is a sectional view through the web of filler material; and

Fig. 3 is a perspective view, partly in section, of a disc cut by clicker dies from said web.

The fibers which are preferably of vegetable origin are all cut into desired lengths, if necessary, after which they are passed through a carding machine of usual construction, indicated at A in Fig. 1 by which they are formed into a continuous web B. This web is then passed through a needle felting machine C which, as is well understood, comprises a plurality of reciprocatory needles having barbs formed thereon whereby tufts or groups of fibers D will be pushed or pulled through the web B when said needles are projected and retracted through the web. In usual practice the needles pass entirely through the web. Subsequent to this so-called "needling" or gigging operation, the fibers are treated or impregnated with a binder, preferably a phenol resin binder of the thermo-setting type. Preferably, a solution of the phenol-formaldehyde resin binder of the heat hardenable type is used.

The needling of the fiber web B causes the fibers to be interlaced or interlocked to an extent that the web retains its form under normal handling conditions and for this reason blanks may be cut from the web with clicker dies if desired, said blanks corresponding in shape to the cross-section of the mold in which the molding operation is performed. The order in which the steps of treating the web with binder solution and of cutting blanks from the web, when this step is used, is immaterial. However, in the present illustration the blanks are formed with the clicker dies E before treating the web with binder, one of said blanks F being shown immersed in the bath G of the binder. One or more of the blanks F, or unshaped sections of the web when blanks are not formed, can be placed in a mold and the molding operation carried out in the conventional manner as to temperatures and pressures, all as is well known in the plastic molding art.

As previously mentioned, the needling or gigging rather securely interlocks the fibers so as to aid in retaining the form of the web B. However, the needled web of fibers possesses other important advantages as a filler material. For instance, the openings formed in the web by the needles never close completely, thus forming minute voids extending through the web whereby permeation or impregnation of the web with the

binder solution is greatly facilitated. Also, the needling of the web compacts the fibers so that blanks or sections formed from the web are not as bulky in the mold as other types of fillers previously mentioned. Hence, there is provided a filler which is fabricated in the sense that the fibers are compacted and bound together to an extent where handling and treatment thereof is materially facilitated while, at the same time, the expense of fabrication is minimized.

The fibers are preferably, but not necessarily, of a length somewhat in excess of the thickness of the web and, as a result, the molded article possesses considerable strength, especially in resisting sudden shocks and impacts. The promiscuous distribution of the fibers in the web has been found to impart more strength to projections on molded articles, for instance, the teeth on gear wheels. In addition, this distribution or disposition of the fibers in the web results in a filler which will "flow" more readily than is true or other fabricated fillers.

What I claim is:

1. A moldable plastic composition composed essentially of a phenol formaldehyde resin binder of the heat hardenable type and a vegetable fiber filler of web-like form with small groups or tufts of the fibers extending through the web and interlocking the surrounding fibers in the web.

2. A moldable plastic composition composed essentially of a phenol formaldehyde resin binder

of the heat hardenable type and a vegetable fiber filler of web-like formation with small groups or tufts of the fiber extending through the web and interlocking the surrounding fibers in the web, there being minute voids formed in said groups or tufts of fibers transversely of said web.

3. A moldable plastic composition composed essentially of a phenol formaldehyde resin binder of the heat hardenable type and a vegetable fiber filler compacted into a web-like body with a majority of the fibers promiscuously disposed throughout the web and with groups or tufts of fibers extending through the web to maintain the compactness of the web, there being minute voids formed in said groups or tufts of fibers transversely of said web.

4. A moldable plastic composition composed essentially of a thermo-setting binder and a filler of web-like form composed of comparatively long vegetable fibers with small groups or tufts of the fibers extending through the web and interlocking the surrounding fibers in the web.

5. A moldable plastic composition composed essentially of a thermo-setting binder and a filler composed of vegetable fibers partially compacted into web-like form whereby penetration of the web by the binder is facilitated, said web having small groups or tufts of fibers extending there-through and interlocking the surrounding fibers in the web.

MILO C. DODGE.