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ARTICLE OF MANUFACTURE

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This invention relates to the art of sand blasting and more particularly to stencils useful in the sand blast etching of stone and the like. It especially contemplates a vulcanized rubber stencil sheet containing a substantial amount of a fibrous filler.

In the stone cutting and engraving industry, particularly that portion concerned with the formation of inscriptions and lettering, it has been customary to cut the letters and designs by hand. This obviously is a very expensive and tedious procedure. An improvement has been proposed, particularly in the manufacture of tombstones, that the stone be covered with a stencil (the design having been cut therethrough beforehand) and the whole face of the stone subjected to a blast of sand or the like. In such a process the uncut portion of the stencil serves to protect the stone while the cut out portions permit the desired erosion of the surface by the sand blast. The development of this method of engraving has been retarded because of a lack of a satisfactory stencil material. Prior to the present invention there was no material sufficiently resistant to the action of the sand blast to permit the cutting of designs of substantial depth or character. In addition the known stencil materials were not suitable where sharply defined outlines were desired because the sand blast caused the known stencil materials to be distorted at the margin of the cut out portions. Furthermore, the known stencil materials failed so rapidly under the sand blast that they were completely destroyed in three to four minutes. It was, therefore, impossible to utilize this method of engraving where deep cut engravings which would require ten to fifteen minutes' exposure to the sand blast were necessary.

This invention had for an object the production of a sand blast stencil sheet which would not creep or spread and which would retain its shape in service to such an extent that the cut out portions would remain sharply defined. Further objects were the preparation of a stencil material which would withstand the action of a sand blast for a sufficient time to permit the engraving of relatively deep letters, designs and the like, and to provide a stencil material which could easily be cut into the desired designs. A still further object was to produce a stencil sheet which would adhere to the surface of the stone being cut. A general advance in the art and other objects which will appear hereinafter are also contemplated.

It has now been found that a stencil sheet having the aforementioned desirable properties may be prepared by vulcanizing a rubber sheet containing a fibrous filler and coating the vulcanized sheet with an adhesive.

The foregoing objects and related ends are accomplished in the manner set out in the following description in which are disclosed details of what is believed to be the best mode for carrying out the invention. The quantities are given in part by weight throughout the application.

Example I

A rubber composition consisting of:

Ingredients	Parts by weight
Crepe rubber	25
Wood flour	20
Montan wax	8
Clay	25
Whiting	15
Mercapto-benzo-thiazole-zinc salt	1
Zinc oxide	4
Stearic acid	.5
Sulfur	1
Phenyl-beta-naphthylamine	.1

was sheeted out to a thickness of about .040 inch on a calender in the usual manner and wound up with a liner of textile fabric of convenient size. The textile liner is a temporary expedient utilized to facilitate handling as is well known to those skilled in the art. The material was then festooned in a vulcanizing chamber and vulcanized by heating to 250° F. (121° C.) for one and one-half hours. The textile liner was then removed and a thin film (about .010 inch in thickness) of a composition consisting of:

Ingredients	Parts by weight
Soft crepe rubber	100
Brown factice	20
Rosin	10
Burgundy pitch	5
Pine tar	5
Mineral oil	5
Zinc oxide	10

calendered to one side of the vulcanized sheet. After dusting the surface of the film with talc the material was ready for use. The product was utilized in stone engraving in the following manner. A piece of the sheet material of suitable shape was cut from the body of the stock material. The dusted surface was then thoroughly wet with gasoline whereupon the coating became quite sticky. It was then placed in position on the stone surface and a design cut out with a sharp knife. The whole (stone and stencil) was then subjected to a sand blast operation in the well known manner. The sand blasting was continued from one to fifteen minutes, depending upon the depth of the engraving desired at various places. The stencil was then easily removed by merely pulling it off the stone surface. It detached cleanly and did not mar the surface of

the stone. The stencil was in good condition and could have been used for another engraving.

Example II

A rubber composition consisting of:

Ingredients	Parts by weight
Crepe rubber	20
Wood flour	10
Montan wax	8
Clay	25
Whiting	15
Mercapto-benzo-thiazole	1
Zinc oxide	4
Stearic acid	.5
Sulfur	1

was sheeted and vulcanized as described in Example I. A film of adhesive similar to that of Example I .02 inch thick was calendered to one side of the vulcanized sheet and over this film there was placed a protective liner of holland cloth. By protecting the adhesive film on the stencil sheet in this way it was not necessary to treat the coating with the solvent for purposes of activation. When the protective liner was stripped from the coating it was in a satisfactory condition for adherence to the stone to be engraved.

Example III

A rubber composition consisting of:

Ingredients	Parts by weight
Crepe rubber	30
Wood flour	40
Montan wax	8
Clay	25
Whiting	15
Mercapto-benzo-thiazole (accelerator)	1
Zinc oxide	4
Stearic acid	.5
Sulfur	1
Phenyl-beta-naphthylamine (antioxidant)	.1

was sheeted and vulcanized as described in Example I. Water soluble glue was spread in a thick film on one side of the sheet. The material was dried to place the product in condition to be offered to the trade. In utilizing the material of this example necessary activation of the adhesive is obtained by moistening the same with water.

In Example I above there is disclosed the preferred embodiment of the invention, and the best mode at present known for utilizing the invention. As will be obvious to those skilled in the art, considerable variation may be made in the proportions of the components of the material of this invention without departing from the spirit and scope thereof.

Ordinarily rubber does not constitute more than about 30 per cent of the mixture to be sheeted. In general an increase in rubber content beyond this amount results in a decreased resistance to the sand blast. A variation from about 20 to about 40 parts by weight of rubber in a composition such as that described above constitutes the preferred range. The wood flour in a similar composition does not generally vary more than from about 10 parts to about 40 parts by weight. The Montan wax, clay and whiting, or any one or two of them may be omitted entirely. The use of more than 20 parts by weight of Montan wax, 30 parts by weight of clay and 30 parts by weight of whiting has not been found to produce any particular advantage.

The composition to be sheeted is not limited to any particular rubber accelerator and antioxidant. A wide variety of these substances are well known to the art and their action is so well understood that the selection of a specific accelerator and a specific antioxidant may be made from a knowledge of their properties. The desirability of specific combinations may be readily determined empirically.

Generally speaking, except for the amount of rubber and filler incorporated in the material to be sheeted, the elements of the composition are matters of compounding technique and may be widely varied depending upon the ideas of the individual preparing the material.

The wood flour may be replaced in whole or in part by an equivalent quantity of such materials as cotton flocks, ground leather, paper pulp, and scrap textile fibers. If desired, combinations of these alternative fibrous materials may be used in place of the wood flour. Other suitable fibrous fillers will be apparent to those skilled in the art.

The rubber adhesive disclosed in Example I is merely illustrative and variations in the composition thereof or the use of other adhesives (which are well known) are within the scope of the present invention.

It has been found that the resistance to the sand blast of a rubber composition of the type described above is materially increased by the presence of fibrous fillers of the type disclosed above.

Variation in thickness of the sheeted material and in the film of adhesive are within the purview of this invention.

Material made according to this invention shows remarkably greater resistance to the action of a sand blast than any material now known. Stencils made out of material constituting the preferred embodiment of this invention have proved to be so durable and resistant to distortion that they were usable a second time. This has never been possible heretofore.

The use of the new material is not confined to the art of sand blast etching of stone. It may be used in connection with the sand blasting of various other materials, for example, glass, metal and similar substances. It is especially suitable for the engraving of tombstones.

As many apparently widely different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that I do not limit myself to the specific embodiments thereof except as defined in the appended claims.

I claim:

1. A coated vulcanized rubber sand-blasting stencil sheet comprising rubber and wood flour associated in the arrangement obtainable by sheeting a composition consisting of:

	Parts
Crepe rubber	25
Wood flour	20
Montan wax	8
Clay	25
Whiting	15
Mercapto-benzo-thiazole-zinc salt	1
Zinc oxide	4
Stearic acid	.5
Sulfur	1
Phenyl-beta-naphthylamine	.1

and vulcanizing the sheeted material, the coating containing rubber in the arrangement obtainable by coating the vulcanized sheet with a composition consisting of:

	Parts
Soft crepe rubber	100
Brown factice	20
Rosin	10
Burgundy pitch	5
Pine tar	5
Mineral oil	5
Zinc oxide	10

2. A coated vulcanized rubber sand-blasting stencil sheet comprising rubber and wood flour associated in the arrangement obtainable by sheeting a composition consisting of:

	Parts
Crepe rubber	20–40
Montan wax	0–20
Clay	0–30
Wood flour	10–40
Whiting	0–30

together with an accelerator and sulfur as required for vulcanization and vulcanizing the sheeted material, the coating being an adhesive secured in the manner obtainable by coating the vulcanized sheet with an adhesive.

3. A vulcanized rubber sand-blasting stencil sheet containing about 30 per cent rubber and about 20 per cent wood flour.

4. A vulcanized rubber sand-blasting stencil sheet containing about 30 percent rubber and 10% to 40% of a fibrous filler consisting of one or more members of the group consisting of wood flour, paper pulp, cotton flock, ground leather and scrap textile fibers.

5. A vulcanized rubber sand-blasting stencil sheet containing 20% to 40% rubber and 10% to 40% wood flour and coated on one side with an adhesive.

6. A flexible rubber-wood flour sand-blasting stencil sheet containing 20% to 40% rubber and 10% to 40% wood flour and coated on one side with a water-insoluble rubber adhesive, the said adhesive coating being of such character that after surface treatment to avoid tackiness to an extent rendering a protective liner unnecessary and activated by treatment with a liquid hydrocarbon it adheres more firmly to the rubber layer than to the surface upon which the stencil has been applied.

7. A vulcanized rubber sand-blasting stencil sheet obtainable by sheeting a composition consisting of:

	Parts
Crepe rubber	20–40
Montan wax	0–20
Clay	0–30
Wood flour	10–40
Whiting	0–30

together with an accelerator and sulfur as required for vulcanization, vulcanizing the sheeted material and coating the vulcanized sheet with a water-insoluble rubber adhesive.

8. A coated vulcanized rubber sand-blasting stencil sheet comprising rubber and wood flour associated in the arrangement obtainable by sheeting a composition consisting of:

	Parts
Crepe rubber	25
Fibrous filler	20
Montan wax	8
Clay	25
Whiting	15
Mercapto-benzo-thiazole-zinc salt	1
Zinc oxide	4
Stearic acid	.5
Sulfur	1
Phenyl-beta-naphthylamine	.1

vulcanizing the sheeted material and coating the vulcanized sheet with a composition consisting of:

	Parts
Soft crepe rubber	100
Brown factice	20
Rosin	10
Burgundy pitch	5
Pine tar	5
Mineral oil	5
Zinc oxide	10

9. A vulcanized rubber sand-blasting stencil sheet containing 20% to 40% rubber and 10% to 40% fibrous filler.

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