

Patented June 4, 1940

2,203,173

# UNITED STATES PATENT OFFICE

2,203,173

## FELTED FABRIC SHEET

William J. Moeller, Mount Healthy, Ohio, assign-  
or to The Philip Carey Manufacturing Com-  
pany, a corporation of Ohio

No Drawing. Application September 6, 1935,  
Serial No. 39,497

2 Claims. (Cl. 92—3)

This invention relates to a felted sheet and particularly pertains to a felt sheet fabricated from a furnish pulp stock which felts in a soft, porous sheet of high absorptivity which may readily be impregnated with a suitable waterproofing material. When the sheet is desired to be more rigid in character the waterproofing material used in preferably hard, thereby stiffening and rigidifying the felt foundation which it impregnates. The impregnated sheet is readily adapted to be embossed with any suitable decorative design and may also advantageously have a decorative finishing layer such as a paint or other suitable material applied to one or both sides.

More specifically described, the invention is typified by felt material composed of waste paper, such as newspaper and the like, waste and manufactured flock and refined wood pulp having an alpha-cellulose content in excess of 93%. These ingredients are pulped in suitable proportions to provide a furnish stock, and then the stock is felted in a water laid web of felt which web may be subsequently impregnated with a suitable waterproofing material. The waste paper material includes all refuse and waste paper material such as newsprint and the like, and may advantageously compose the predominant proportion of the furnish stock. A sheet composed entirely of or nearly all of waste paper material is relatively compact and dense and not of a porous character suited for being highly absorptive to a waterproofing material. Accordingly it is not particularly suitable for being impregnated, especially where a large quantity of waterproofing material is to be impregnated in the web. Because of this, waste paper material has had only a limited use, and then only in small proportions with other materials as a cheap filler. It has been found, however, that a furnish stock capable of being felted into highly absorptive sheets, may be composed of a predominant proportion of waste paper material by having certain other material associated therewith in subordinate proportion. One material suitable for combining with the waste paper material is typified by flock materials which are recovered in several of the manufacturing processes through which textile fabrics must pass in finishing. There are two types of flocks: those resulting from scouring, fulling, raising, brushing and shearing of woolen fabrics. The others are those resulting from rag grinding and tearing in the preparation of reclaimed wool. The difference between these two types is that one is waste or refuse material

which results from the manufacture of fabrics whereas the other is flocks which are themselves manufactured for particular uses. There are in the manufacture of carpets a large quantity of waste flock material which is short waste fibers resulting from the waste accumulations and these are particularly suitable as an ingredient in combination with waste paper material for the manufacture of felt sheets. Another material suitable for combining with the waste paper material is refined wood pulp having an alpha-cellulose content in excess of 93%. This refined wood pulp is attained by treating alpha-wood fibre with an alkali refining material. For example, chemical wood fibre such as sulphite pulp may be subjected to a series of treatments with chemical reagents including a treatment with alkaline liquor which serves to dissolve from such wood pulp non-alpha-cellulose components such as less-resistant celluloses, ligno-celluloses and resins to produce a fibre stock having an alpha content of about 93% or greater. Alpha wood fibre is preferably felted in an unbeaten or lightly beaten condition and has greater freedom from fibre fragments and colloidal cellulose as well as from hemi-celluloses and resins than unrefined wood pulp of the character of sulphite kraft or the like. The usual commercial sulphite has an alpha-cellulose content of about 87%. The addition of the flock and the alpha-cellulose content of the character described gives the felt a high degree of porosity and absorptivity whereby same may be impregnated with a bituminous saturant, such as asphalt or the like, to about 155%, by weight of the saturant. Moreover the sheet is particularly strong and by using an impregnating material which is hard, the felt base may be rendered substantially rigid and board-like in character. Ordinarily felts which are used as a foundation sheet for waterproofed panels, roofing and the like, are impregnated or saturated with bituminous compositions which are usually soft in consistency, having a penetration of not greater than 60 at 70° F. and a fusing point by the B. and R. method between 95 to 160° F. These saturating compositions are ordinarily employed merely to saturate and waterproof the foundation felt and without materially affecting its physical character. They are not of a character to stiffen or rigidify the foundation sheet. It is one of the aims of this invention to give to the felt a hard and rigid character to provide a substantially hard rigid body, and in order to effect this, the felt is saturated with a special hard waterproofing composition. A suitable

5 saturant is typified by an asphalt composition  
 blown to a penetration of 3 to 5 at 77° F. and  
 having a melting point over mercury of from  
 200° to 230° F. This asphalt impregnating com-  
 10 position is made especially hard to give the felt  
 foundation rigidity, hardness and waterproof-  
 ness after impregnation. It is sometimes referred  
 to as combining asphalt and is considerably hard-  
 15 er than bituminous compositions commonly used  
 for impregnating fabrics. Impregnating ma-  
 terials other than asphalt may be employed for  
 saturating the felt, and rubber may be referred to  
 as such. Sheets impregnated with the hard im-  
 20 pregnating material are particularly adapted for  
 lining automobiles such as under the dash, doors,  
 bottom sides of seats and the like and may also  
 be used for panels or linings for facing any rigid  
 or semi-rigid base. They may be used in single  
 25 ply or several of the plies may be adhered to-  
 gether by an adhesive layer or an adhesive layer  
 of the same hard character as the impregnating  
 material in order to further rigidify and stiffen  
 the laminated or composite sheet. Or instead of  
 having all the plies of the character of felt ma-  
 30 terial herein described, laminated or composite  
 sheets may be provided in which the felt sheets  
 of the character herein described are employed  
 as the facing or exposed sheets having a core of  
 different character. For example, a center ply or  
 35 plies of light kraft paper may comprise the core  
 and have applied to opposite sides thereof fac-  
 ing sheets of felt of the character above described.  
 The impregnated felt sheets being substantially  
 rigid by reason of the impregnating material are  
 adapted to be embossed for decorative purposes.  
 Also the felt sheets whether embossed or not  
 may be decorated by having a suitable decorative  
 material such as paint applied thereto. A water  
 paint is particularly advantageous and one coat

thereof applied at the time of manufacturing  
 the saturated felt conditions same for ultimately  
 finishing with fewer coats of finishing paints.

As one embodiment typifying the invention and  
 illustrating preferred proportions of the com- 5  
 ponents of the furnish stock, a felt sheet may be  
 fabricated composed of about 75% newspaper  
 material, about 10% carpet flocks and about 15%  
 of the refined wood pulp having an alpha-cel-  
 lulose content of about 93%. These ingredients 10  
 are reduced to a furnish pulp stock in a con-  
 ventional beater and may then be felted on any  
 suitable Fourdrinier or cylinder machine which  
 is used for fabricating felt. The furnish stock  
 is then impregnated with waterproofing and fin- 15  
 ished by embossing and/or painting. The sheet is  
 particularly suitable in the manufacture of auto-  
 mobile bodies and other similar uses where  
 shrinkage is limited within certain specifications.

While I have described one embodiment of the 20  
 invention in detail for the purpose of illustra-  
 tion, it will be understood that there may be  
 various changes without departing from the  
 spirit thereof, particularly as to the proportions  
 of the different materials composing the felt. 25

I claim:

1. A waterlaid web of felt composed of furnish  
 stock comprising about 75% newspaper, about  
 10% flock derived from woolen fabrics, and about  
 15% refined wood pulp having an alpha-cellulose 30  
 content in excess of 93%.

2. A waterlaid web of felt composed of furnish  
 stock comprising about 75% newspaper, about  
 10% flock derived from woolen fabrics and about  
 15% refined wood pulp having an alpha-cel- 35  
 lulose content in excess of 93%, said felt being  
 impregnated with a waterproofing material.

WILLIAM J. MOELLER.