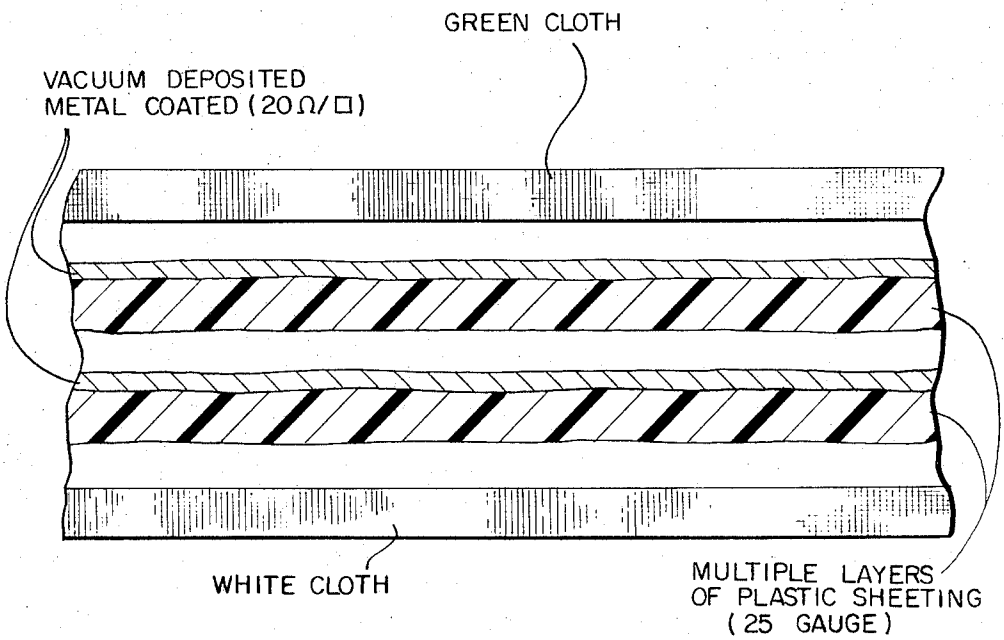
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RADAR COUNTERMEASURE ARTICLE

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# RADAR COUNTERMEASURE ARTICLE

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The present invention relates to countermeasure devices and more particularly to covers for preventing the detection of tanks, trucks, etc. by radar or infra-red scanning equipment. We have discovered a new construction for a blanket which almost completely attenuates radar waves which may be incident upon the blanket. The blanket also prevents the transmission of infra-red radiation. Thus, the blanket can be thrown over a tank or truck to provide effective concealment from these detectors. It should be understood, however, that blankets made according to our invention may have many other uses aside from the above military context. Therefore, references to radar countermeasure blanket herein are intended to refer broadly to blankets having, inter alia, the property of attenuating electromagnetic radiation in the range of wavelengths used for radar and as set forth herein.

The radar countermeasure blanket can be folded up to a very small size when not in use. It can be folded and unfolded repeatedly without adversely affecting the above-described properties of preventing or limiting transmission of radar and infra-red.

The blanket can be combined with conventional camouflage covers in a composite blanket. Conventional camouflage covers such as cotton cloth transmit radar without interference, rejection or absorptance.

Other objects, features, and advantages of the invention will now in part be obvious and will in part be set forth hereinafter.

A preferred embodiment of our invention is now described with reference to the accompanying drawing which schematically indicates the cross section of the radar countermeasure blanket.

The drawing shows the arrangement of the blanket in cross-section. A green camouflage cotton cloth **10** is placed on one side and a white camouflage cotton cloth **12** is placed on the other side for summer and winter use. Several layers **14** of vacuum metallized plastic sheeting are disposed between the cloths as an interlayer. The metal coatings are indicated at **16**. In the preferred embodiment, six such plastic sheets are used. The individual plastic layers are 25 gauge polyester film vacuum aluminized to provide a continuous coating which is thick enough to provide at most 2% transmittance throughout the near infra-red (1–15 microns) range and thin enough to exhibit a resistance of considerably above 1 ohm per square, preferably at least 20 ohms per square. Best results have been obtained at 30 ohms per square or above.

In the course of usage of the blanket, the resistance of each coating tends to increase. In the preferred embodiment, we deliberately wrinkle each sheet after it is aluminized to increase the average resistance of its coating to at least 100 ohms per square and preferably to 150 ohms per square or more. The wrinkling technique can be as simple as rolling or folding back portions of the sheet and twisting. The two cloths and six layers of metallized sheeting are then laid together. They can be stitched along the border of the blanket or are held together by the use of adhesives at the edges.



The vacuum aluminizing of the individual polyester layers may be carried out by the vacuum vapor deposition technique, described, for example, in Patent 2,665,223. However, it should be understood that there are also other vacuum vapor deposition techniques which are sufficiently controllable to provide the requisite coating resistance consistent with continuous coverage. As a measure of the continuity and thickness of the coating, its resistance should be less than 100 ohms per square before wrinkling the polyester, as described above, with resultant increase in resistance.

There can be a wide range of variation in the choice of plastic substrate. Essentially any durable plastic sheeting which can be vacuum metallized is useful. Similarly, other metals can be substituted for aluminum. For instance, tin can be vacuum deposited on the plastic layers in thicknesses which give the same resistance limits as required above for aluminum. The tin coated material has a better resistance to moisture than aluminum.

The number of layers of metallized plastic required in the blanket is variable. At least two layers are necessary as a lower limit. When the two layers are wrinkled to increase their resistance to 150 ohms per square and tested with respect to radar transmission, the two layers together give an attenuation of 18–20 decibels. They also provide an opaque barrier to incident light in the far infrared region of wavelengths. Increasing the number of layers to four provides an opaque barrier to incident light in the near infrared region of wavelengths.

It is surprising that this large attenuation of radar is obtained by metallized plastic arranged as described above. This property is believed to be due to internal reflections within the blanket. The blanket is of such a nature that it can reliably maintain this characteristic through long periods of rough handling in the field. The blanket is of such a nature that it combines the characteristic of radar attenuation with infra-red opacity, flexibility and the fact that its components are inexpensive and readily available within the state of the art and that it can be easily assembled and combined with other useful components, such as a camouflage cover, if desired.

It will be appreciated that other variant physical embodiments and uses can be provided within the scope of my invention. It is therefore intended that the above material shall be read as illustrative and not in a limiting sense.

What is claimed is:

1. A radar countermeasure blanket providing an attenuation of at least 10 decibels to radar waves incident on the blanket and being essentially opaque to far infra-red radiation and comprising, in combination, at least two layers of thin plastic sheeting, each of the layers having a vacuum deposited metal coating thereon, the coating in each instance being sufficiently thin to exhibit a resistance considerably above 1 ohm per square.

2. The blanket of claim **1** wherein the coating on each layer is sufficiently continuous that it exhibits a resistance of less than 100 ohms per square immediately after vacuum deposition of the metal coating thereon.

3. The blanket of claim **1** wherein the coating on each of said layers is sufficiently thin to exhibit a resistance of at least 20 ohms per square.

4. The blanket of claim 1 further comprising at least one cover layer of camouflage cloth, the cloth being transparent to radar waves.

5. The blanket of claim 1 wherein the coated plastic layers are wrinkled sufficiently so that the metal coatings thereon exhibit resistance of at least 100 ohms per square.

6. The blanket of claim 1 being essentially opaque to near infra-red radiation, as well as far infra-red radiation, and comprising at least four layers of vacuum metallized plastic sheeting, the plastic sheeting of each layer being about 25 gauge thickness.



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