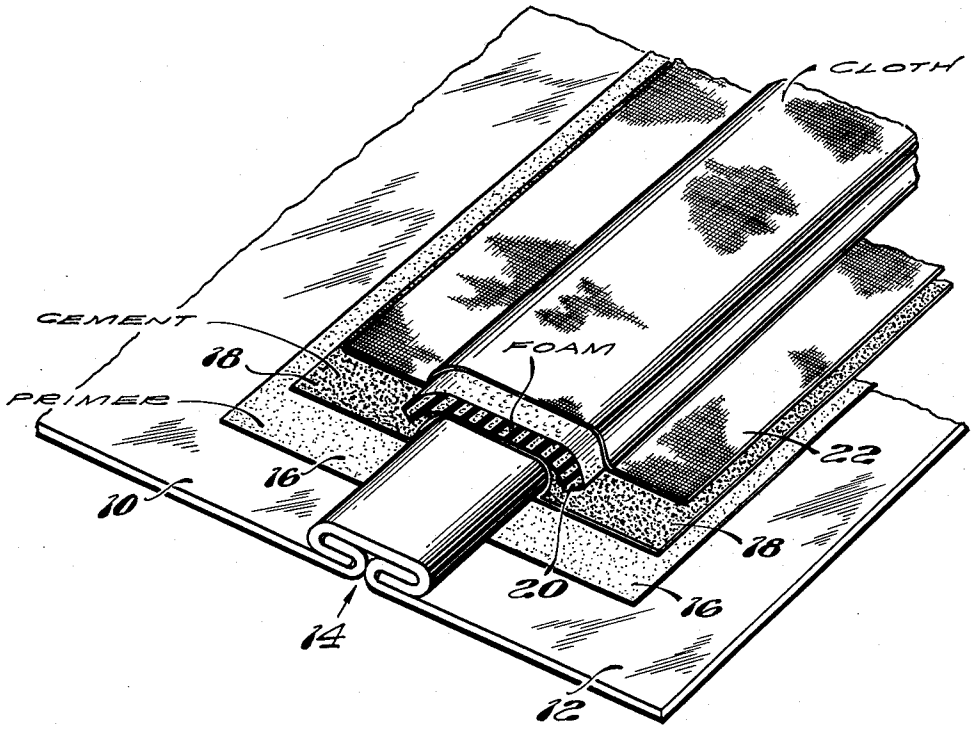
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DEVICE FOR SEALING A SEAM FORMED
BY ADJACENT METAL PLATES
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DEVICE FOR SEALING A SEAM FORMED BY ADJACENT METAL PLATES

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This invention relates to a device for sealing a seam formed by adjacent metal plates and more particularly to a device for waterproofing the roofs of truck bodies.

It is now common to construct truck bodies and truck trailer bodies of aluminum or other metal sheets. It has been found impossible to make the roofs of these bodies from one continuous sheet because of the torque action which results from the motion of a truck over an uneven surface. The usual practice is to fasten together a number of smaller metal plates to form a complete roof. This results in a roof which is sufficiently flexible to withstand torque action of a moving truck, but after a certain period of time it has been found that leaks will develop at the seams of the metal plates. This results from the constant relative movement of adjacent plates along their common seam, which is necessary in withstanding the torque action.

In the past various substances have been used in attempts to seal the leaks which develop in these seams or to prevent the development of leaks. Thus epoxy resins, neoprene, and paint have all been used but have been found unsuccessful because they harden and crack after a relatively short time. Putty has been equally useless because the motion of the adjacent plates has forced the putty out of their seam. If cloth is applied directly over a seam and is cemented to the adjacent plates the relative motion of the plates parallel to the seam will either be prevented or will tear the cloth.

It is an object of our invention to provide a seal for the seams of adjacent metal plates which still allows the plates to move a slight amount relative to each other. The major portion of such movement will be parallel to the seam, but it should be understood that our invention will allow movement in other directions, such as movement of one plate out of the single plane customarily occupied by both or even a slight amount of separation of the plates.

It is another object of our invention to provide a seal which is substantially as long lasting as the truck body itself. It is a further object of our invention to provide a seal which can be applied easily and inexpensively to a truck body roof, whether the truck is new or old. In the accomplishment of these and other objects of our invention in a preferred embodiment thereof, we employ a narrow strip of a suitable foam material such as urethane and a substantially wider strip of waterproof cloth material such as neoprene impregnated nylon. After the surface of a truck body roof is cleaned and prepared with a coat of a primer for adhesives, a narrow foam strip is cemented directly over a seam. A wide strip of waterproof cloth is then laid over the foam strip with a substantially equal width of material extending to each side of the foam strip, and the portions of the cloth which lie on the metal plates are cemented to them. This effectively seals the seam yet still allows a certain amount of movement of the adjacent plates.

It is a feature of our invention that the foam material can be compressed when the overlying cloth material is

stretched in any manner. Stretching might result from the relative movement of adjacent plates parallel to their seam, since the cloth on both sides is firmly cemented to the plates. If there were no compressible foam material under the cloth this type of movement would either tear the cloth or loosen the cement holding the cloth. With the compressible foam material in place there is a certain amout of slack in the cloth which can be taken up by compressing the foam. The same result occurs during movement of adjacent plates in other directions.

It is another feature of our invention that the materials used are long lasting and are employed in a manner which assures their continuing usefulness. For instance, cement is applied uniformly over the entire area to be covered by the foam and cloth material. Thus the foam is firmly held over the seam, and the cloth is secured to the adjacent metal plate at all points except where the cloth lies directly over the foam.

It is a further feature of our invention that the materials employed are relatively inexpensive and are easily applied to any truck body roof. In particular the task of applying the cloth material is made easier because the foam strip acts as a guide in laying down the cloth so that half its width goes on each side of the foam strip.

These and other objects and features of the invention will best be understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration, and shown in the accompanying drawing in which:

The single figure is a perspective view, partially cut away for purposes of clarity, of a sealing device applied over a seam between metal plates.

In a preferred embodiment of our invention, clean, dry, bare metal plates **10** and **12** which are joined at a seam **14** are covered with a single coat of metal primer for adhesives **16**. The primer **16** is a synthetic rubber and resinous solution type. The primer **16** is covered with a cement **18** which is a neoprene solvent type adhesive cement. A foam strip **20** is cemented along the seam **14**. A foam strip **20** with the dimensions 1½" wide by ¼" thick is sufficient to cover most metal seams found on truck body roofs. The foam strip **20** in this preferred embodiment is composed of Type 2 urethane, with a density of 2.25 pounds per cubic foot.

A cloth strip **22** substantially wider than the foam strip **20**, as shown in Fig. 1, covers the foam strip **20** and is secured to the metal plates **10** and **12** by the cement **18**. The cloth strip **22** overlaps approximately as far beyond one side of the foam strip **20** as the other. The composition of the cloth strip **22** is nylon impregnated on the side away from the seam **14** with an impervious and weather resistant compound and on the side towards the seam **14** with a gum compound which adheres to the foam strip and increases the adherence of the cloth strip **22** to the cement **18**.

The nylon is a plain weave, 5.1 ounce, 840 denier, and **23 x 21** count. Both the weather resistant and gum compounds are essentially neoprene Type WRT mixed together with other ingredients not in and of themselves critical to this invention.

In the application of our sealing device to a truck body roof, we have found that the most effective seal results when the foam strip **20** is cut a few inches shorter than the length of a seam **14**, while the cloth strip **22** is cut to the exact length of the seam **14**. The overlapping of the cloth strip **22** at both ends of the seam **14** prevents water or other substances from working in under the cloth strip **22**.

In the operation of our sealing device on a truck body roof, the compressible nature of the foam strip **20** permits stretching of the cloth strip **22** in various directions. When the metal plates **12** and **10** move relative to each

other parallel to the seam 14, the cloth strip 22 remains firmly attached to the cement 18 on both plates 10 and 12, and the stretching which occurs in the cloth strip 22 above the seam 14 compresses the foam strip 20. Similarly if one of the plates 10 and 12 moves out of the same plane as the other so that the seam 14 acts as a hinge, the foam strip 20 is compressed and also if the plates 10 and 12 separate slightly the tension on the cloth strip 22 compresses the foam strip 20.

Certain minor variations of this preferred embodiment will be apparent to those skilled in the art. For instance, the composition of the materials used may be altered without affecting the results achieved. Foam rubber instead of urethane may be used for the foam strip. Any imperivous flexible sheet material which can be cemented to a metal surface can be used in place of the neoprene impregnated nylon cloth strip. Therefore it is not our intention to confine the invention to the precise form herein shown, but rather to limit it in terms of the appended claims.

Having thus described and disclosed a preferred embodiment of our invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. A device for sealing a seam formed by adjacent metal plates yet permitting a slight amount of relative motion between said metal plates, comprising a urethane foam strip covering said seam, said urethane foam strip being slightly shorter than said seam and slightly wider than said seam, a sheet of neoprene impregnated nylon cloth covering said urethane foam strip, said sheet being approximately as long as said seam, and substantially wider than said urethane foam strip, and overlapping onto said adjacent metal plates by an approximately equal amount on each side, and means consisting of a cement applied to said adjacent metal plates and an adhesive gum applied to said sheet for firmly attaching said sheet to said adjacent metal plates.

2. The device for sealing a seam defined in claim 1 further characterized by means consisting of a cement applied to said adjacent metal plates for firmly attaching said urethane foam strip to said metal plates.

3. A device for sealing a seam formed by adjacent metal plates yet permitting a slight amount of relative motion between said metal plates, comprising a urethane foam strip covering said seam, said urethane foam strip being slightly shorter than said seam and slightly wider than said seam, a sheet of neoprene impregnated nylon cloth covering said urethane foam strip, said sheet being approximately as long as said seam, and substantially wider than said urethane foam strip, and overlapping onto said adjacent metal plates by an approximately equal amount on each side, said sheet having an impervious side and an adhesive gum side, said impervious side facing away from said seam, and said adhesive gum side facing toward said seam, and means consisting of a cement applied to said adjacent metal plates for firmly attaching said adhesive gum side of said sheet and said urethane foam strip to said adjacent metal plates.

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