Dec. 6, 1966 E. R. McLAUGHLIN ETAL 3,289,365

ELECTRICAL CONTINUITY FOR ALUMINUM SIDING

Filed Dec. 3, 1963 2 Sheets-Sheet 1

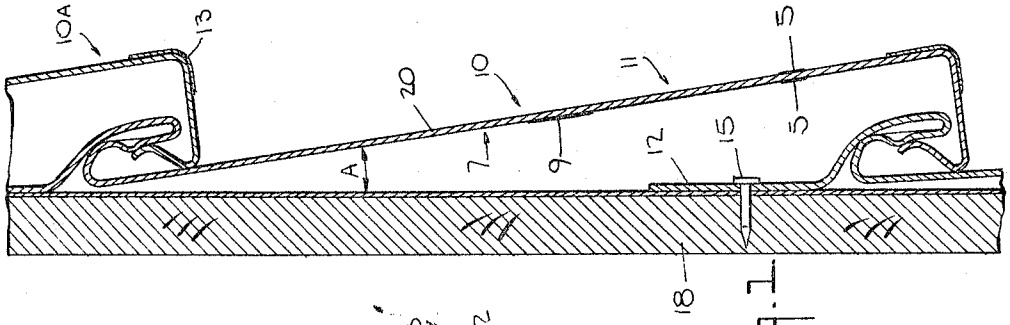


Fig. 1

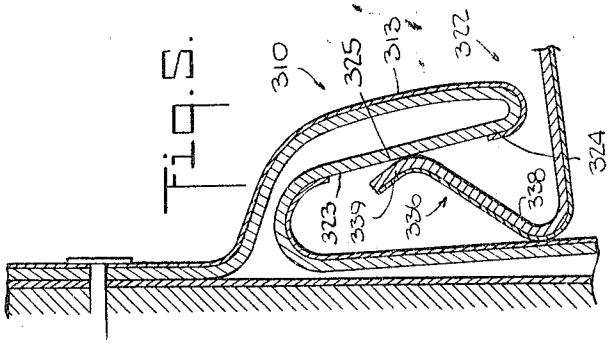


Fig. 5.

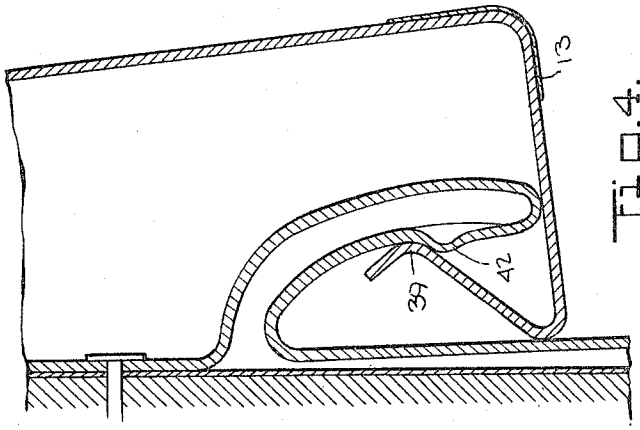


Fig. 4.

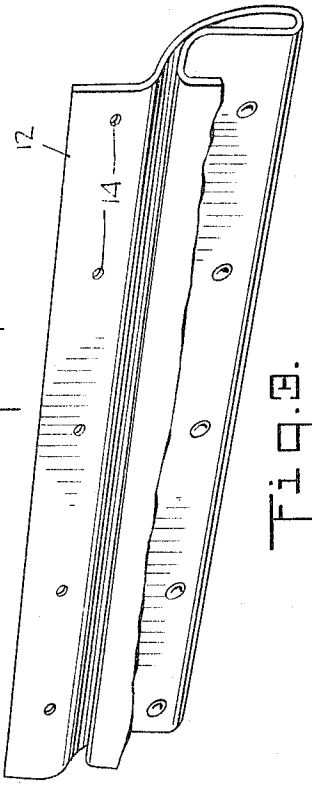


Fig. 3.

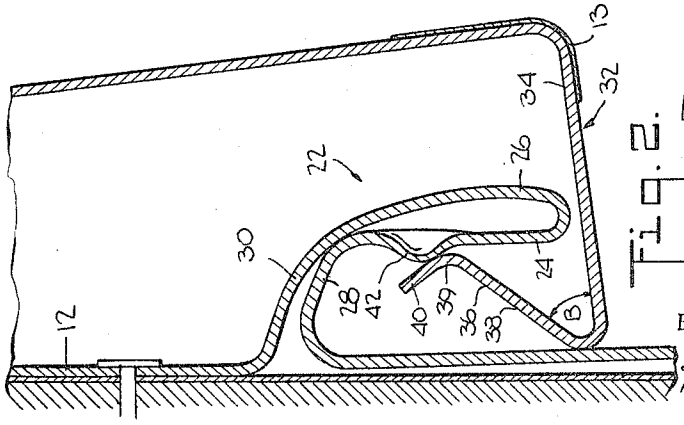


Fig. 2.

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ELECTRICAL CONTINUITY FOR ALUMINUM SIDING

Filed Dec. 3, 1963 2 Sheets-Sheet 2

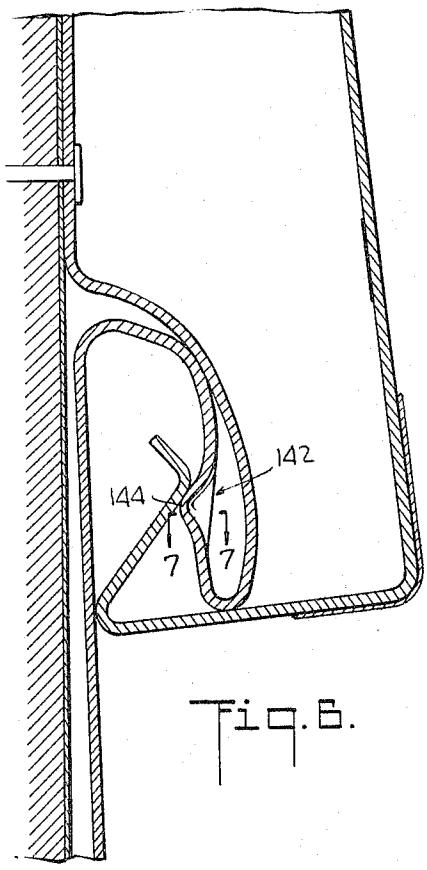


Fig. 6.

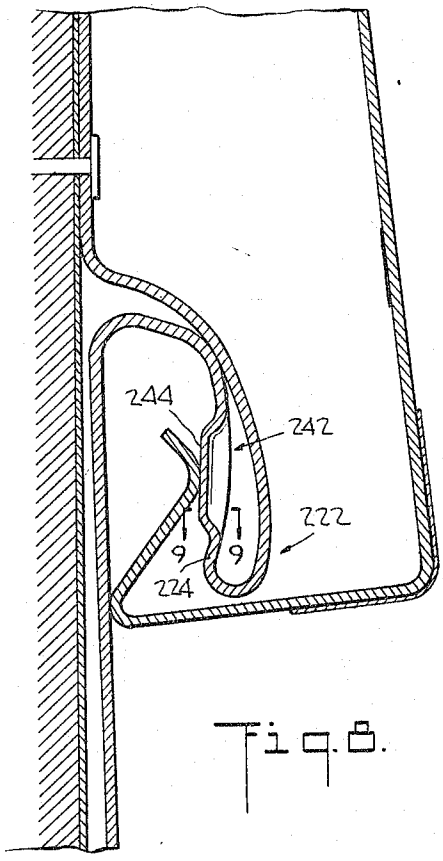


Fig. 8.

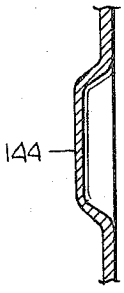


Fig. 7.

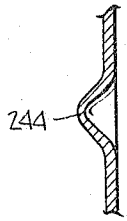


Fig. 9.

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United States Patent Office

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ELECTRICAL CONTINUITY FOR ALUMINUM SIDING

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Filed Dec. 3, 1963, Ser. No. 327,686
1 Claim. (Cl. 52—173)

The present invention relates to metallic siding panels, and particularly to a new aluminum panel and method of forming said panel and securing it in position on a structure.

In recent years there has been a substantial increase in the use of aluminum siding panels for residences and like structures. Aluminum siding panels are ideal for such application, being easily installed and requiring virtually no maintenance, yet providing an attractive and durable covering for the structure. Aluminum, because of its inherent electrical conductivity, is also electrically safer as an exterior siding material than other materials heretofore used. However, aluminum siding panels are usually provided with a decorative and protective coating, usually paint, and a thinner interior coating and, thus, achievement of electrical continuity between panels is dependent upon removal of the coating incidental to the interlocking of panels in the erection process and working of the joint due to expansion and contraction.

It is proposed in the present invention to provide a simply constructed aluminum siding panel and method of installation which insures positive electrical continuity between adjacent panels immediately upon application of the siding to a residence. Such electrical continuity permits ready grounding of all the metallic siding panels, thus avoiding the possibility of accidental energization of the siding due to contact with faulty electrical wiring or equipment.

Aluminum panels are generally provided with a longitudinal interlock between contiguous panels. This interlock is provided to retain the one free edge of each panel and to exclude moisture and other undesirable matter from entry behind the panels along their common joint. This interlock usually includes a pair of mating sections, one on each panel, which overlap in intimate contact to form a proper panel joint. In the present invention, one of said interlock sections is provided with a plurality of protuberances formed thereon, the protuberances being formed preferably such that the convex portion is on the face of the metal having the relatively thicker coating of paint thereon. Forming of the protuberances sufficiently weakens or destroys the paint film thereacross so that, when the mating interlock sections are slidably brought into intimate contact as the joint is formed, the resultant abrasive action between the protuberances and the thin interior coating causes a positive electrical engagement of the adjacent panels, providing electrical continuity therebetween while still maintaining an effective joint.

In another embodiment of the invention, the interlock protuberances are replaced by a selected pattern of coating, whereby predetermined portions of the particular interlock sections are uncoated, or wherein discrete areas of the coating are removed, as by knurling or embossing. Thus, when the panels are brought into adjacent position, they are in intimate contact at the selected uncoated portions of the mating interlock sections. While it may be desirable that the panels be in metal-to-metal contact at the uncoated zones thereof, it has been found that the desired electrical continuity of adjacent panels is achieved where only the outer decorative or protective coating is eliminated or removed and the panels are separated by the chemical conversion coating or film usually applied to the base panel metal to improve coating adherence. This

chemical film does not interfere with the conductivity of the panels.

Further objects and advantages of the invention will be obvious herefrom or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claim.

The foregoing general description and the following detailed description are exemplary and explanatory, but are not restrictive of the invention.

Of the drawings illustrating by way of example preferred embodimnnts of the invention and wherein like numerals designate like parts:

FIG. 1 is a side elevation, partly in section, of a portion of a wall structure, showing one complete course of upper and lower successive panels and fragments of coatings of chemical undercoat and inner and outer paint coatings;

FIG. 2 is a detailed sectional elevation of the interlock between successive panels and illustrating one embodiment of the invention;

FIG. 3 is a perspective view of the upper portion of a panel provided with the embodiment of the invention shown in FIG. 2;

FIG. 4 is a view of the sectional elevation of the panel of FIG. 3, illustrating a second interlock position between successive panels;

FIG. 5 is a sectional elevation of the interlock section between successive panels illustrating another embodiment of the invention;

FIG. 6 is a sectional elevational of a modified form of interlock;

FIG. 7 is a sectional view taken along line **7**—**7**, FIG. 6;

FIG. 8 is a side elevation of a modified form of interlock;

FIG. 9 is a sectional view taken along line **9**—**9**, FIG. 8.

Referring to the drawings, and specifically to FIGS. 1–4, the present invention is concerned with a metallic siding panel designated generally **10**, utilized for the outer covering of buildings, such as residences and the like. The invention is particularly concerned with aluminum sidings. However, the panel can be formed of other metals without adverse effect.

The outer face **11** of panel **10** is provided with a decorative and protective coating **13**, such as paint, and inner face **7** thereof with a thinner coat **9** to withstand the effects of weathering and simultaneously present an attractive appearance for the residence. As stated hereinabove, the faces **7** and **11** of metal panel **10** are usually provided, as by dipping or spraying, with a chemical film **5**, which prepares the metal for the application of the decorative and protective coats **9** and **13**. Actually, these coats extend along on their entire respective surfaces, but are shown only partially in FIGS. 1, 2, 4, 6 and 8 for convenience.

Panel **10** structurally comprises an attaching section **12** having a plurality of holes or apertures **14** spaced to accommodate the panel securing means, such as nails **15**, which are driven into the framing material **18** to secure the panel in place. The major portion of the panel width is formed of the body section **20**, which depends downwardly relative to the attaching section and at a slight outward angle A relative to framing **18**. It will be obvious that the slight outward disposition of the body panel thus permits ready run-off of rain and other moisture from the panel.

The attaching and body sections are joined by a first panel interlock section **22**, which includes a generally U-shaped section formed of legs **24** and **26**. Legs **24** and **26** are generally parallel to the body panel, except at their upper ends where they are bent into adjacent relationship, and include arcuate extensions **28** and **30**, respectively,

which joint the upper ends of their associated leg sections to attaching panel **12** and body panel **20**, respectively. Interlock **22** is formed continuously with legs **24** and **26**, and extensions **28** and **30**, as will be noted best from FIG. 2, are angularly disposed with respect to their associated legs and project preferably about at right angles from connected sections **20** and **12** so that the interlock **22** is spaced from body section **20** outwardly in a direction away from framing **18**.

Body section **20** terminates in a bottom section **32** formed of a transverse bottom plate member **34** and a second interlock section **36**, which includes lip member **38** and edge member **40**. Bottom plate **34** projects backwardly from body section **20** toward structure **18** with interlock section **36** being formed as a continuation of bottom plate **34** with lip member **38** angularly related to plate **34** and forming therewith an acute angle B. Likewise, edge section **40** is generally transverse to lip member **38** to form the second interlock section **36** in a generally reverse curve configuration with a nose portion **39** disposed between members **38** and **40**.

To insure electrical continuity between successive panels, leg **24** of interlock section **22**, in the embodiment shown in FIGS. 1–4, has formed therein a plurality of spaced indentations or protuberances **42**, which extend outwardly of leg **24** in the direction of body panel **16**. It has been found that a simple manual punching operation can be used to form protuberances **42**. However, if desired, such protuberances can also be formed in interlock **22** during the manufacture of panel **10**. The formation of protuberances **42**, as by punching, cracks or weakens the covering **13** of face **11**, effectively destroying the covering adjacent the indentations **42** and exposing portions of the underlying metal.

In operation, successive panels are secured to framing **18** such that the first interlock section **22** of the next successive panel **10** engages nose **39** of the interlock section **36** of the previous panel **10A**. In the present invention, the protuberances **42** of the interlock section **22** of the panel **10** are in firm contact with the second interlock section **36** of panel **10A**, adjacent the nose portion **39** thereof.

FIGS. 2 and 4 illustrate two possible engagement positions of the protuberances **42** and nose **39**. In FIG. 2, the protuberances **42** are disposed above nose **39** and wedged thereagainst with the lowermost portion of interlock **22** spaced from bottom plate **34**. In the second configuration, interlock **22** rests on bottom plate **34** with protuberances **42** located beneath nose **39**. In this latter configuration, due to the inherent resilience of the panel, there is a snap-action fit or engagement between the first and second interlocks **22** and **36** as protuberances **42** move past nose **39**. In either arrangement, due to the positive frictional engagement realized by means of the protuberances **42**, firm electrical contact is achieved between the successive panels.

In the embodiment shown in detail in FIGS. 2–4, protuberances or dimples **42** are generally conical. However, alternate dimple configurations may also be advantageously employed. FIGS. 6–9 illustrate alternative dimple designs.

In FIGS. 6 and 7, protuberances **142** are peaked as at **144**, but are elongated in the longitudinal direction of the panel to form an elongated ridged configuration.

In FIGS. 8 and 9, protuberances **242** are elongated along the length of leg **224** of interlock **222**, and are ridged as at **244** to form an elongated peaked configuration similar to dimple **142** of FIG. 6, but oriented transverse thereto.

FIG. 5 discloses alternative means for insuring electrical continuity between successive panels. In this embodiment, panels **310** are provided with an outer decorative and protective surface or coating **313** and an inner coating **309**. However, the interlock section **322** of panel **310** has selected uncoated zones **323**, **325** along the panel length. These zones are achieved either by selected coating or removing the coatings from discrete areas thereof as by knurling or embossing. Zones **323** are located on leg **324** of section **322**, which is the leg normally in intimate contact with interlock **336** of the previous panel to form the joint therebetween. Zones **325** are provided on face **338** of nose **339**, adjacent the location thereof normally in engagement with leg **324**. Thus, when successive panels are secured in contiguous relationship and interlocks **322** and **336** of successive panels **310** are in engagement, there is contact between zones **323** and **325** of the panels, and thus electrical continuity therebetween is accomplished. As described hereinabove, metal-to-metal contact, while desirable, is not essential, since the chemical film on the panels does not prevent electrical continuity therebetween.

In connection with the embodiments of the invention shown in FIGS. 1–4 and 6–9, when the dimple **42**, **142** or **242** is formed in the siding or panel **10**, the protective covering or paint layer **13** on face **11** is stretched sufficiently to fracture it and destroy its adhesion to the metal body of panel **10**. Under the microscope, it has been found that the fractures are small arcs with center of curvature at the peak of the dimple. The film **11** is fractured and loosened so that it can be wiped off easily with a cloth or any scraping action, as when panels **10** and **10A** are assembled as shown in the accompanying drawings.

Further, if desirable, the interlock sections can be formed as shown schematically in FIGS. 4 and 5, such that, as the adjacent panels are urged into assembled position, a wedging action is developed therebetween, thereby forming an improved joint.

Since siding panels are erected with staggered end joint relationship on building walls having dimensions in excess of the length of individual panels, the entire wall may be grounded by suitable attachment of a grounding conductor to any individual panel. If more than one wall is covered with siding, electrical continuity of the whole may be obtained by suitable electrical interconnection between walls or physically isolated areas of siding. Thus, with the side panels being all electrically interconnected and grounded, no damage can result from such things as faulty wiring.

It will be understood that while particular reference herein has been made to vertically-related adjacent panels, the invention is equally applicable to other adjacent panel relationships. Likewise, while one form of interlock has been shown by way of example, other interlock configurations can be employed herein with equal efficacy.

Although certain particular embodiments of the invention are herein disclosed for purposes of explanation, further modifications thereof, after study of the specification, will be apparent to those skilled in the art to which the invention pertains. Reference should accordingly be had to the appended claim in determining the scope of the invention.

What is claimed and desired to be secured by Letters Patent is:

A metallic siding including at least two successive interlocking panels having a protective coating on one side thereof and each comprising: an attachment section for accommodating means for securing same to an under surface, a body section formed as a continuation of said attaching section, a first interlock section between said attaching and body sections, said interlock section including a generally U-shaped portion the legs of which are generally parallel to said attaching and body sections and a pair of extensions joining the legs of said interlock to said attaching and body section and maintaining said U-shaped portion in spaced relation to said body section, a bottom section angularly disposed to said body section and connected thereto at a point remote from said attaching section, a second interlock section joined to said bottom section engaging the U-shaped section of the first interlock section of the adjacent successive panel in the space between said U-shaped and body section, and protuberances spaced longitudinally along the coated surface

of one of said interlock sections, the coating being fractured in the area of said protuberances by the formation of same, said protuberances engaging the adjacent panel at the interlock section devoid of the protective coating to effect electrical interconnection of said adjacent panels.

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