The individual strips of inherently flexible, self-adhering chlorinated olefin polymers comprising the resealing means of the present invention are prepared from polymeric material obtained by chlorination of essentially linear finely divided polyethylene or interpolymer containing at least about 90 mole percent of ethylene in the polymer molecule, which polymers have a molecular weight of less than 1,000,000 and preferably between about 20,000 and 300,000.

More specifically, the preferred chlorinated olefin polymers utilized contain from about 25 and 50, and preferably between about 30 and 40, weight percent of chemically combined chlorine. Particularly preferred chlorinated olefin polymers are those prepared by chlorination in aqueous suspension, which are further characterized by having a relative crystallinity of between about 15 and 28 percent when containing about 25 weight percent chlorine, and a relative crystallinity of less than about 10 percent when containing about 54 weight percent of chemically combined chlorine. Such preferred chlorinated polyolefins are readily obtained by practice of a chlorination procedure which comprehends the suspension chlorination in an inert medium of finely divided polymers and interpolymers of ethylene to a controlled total of combined chlorine content, wherein such polyolefin is first chlorinated at a temperature of up to about 110°C, and preferably between about 65°C and 110°C for a period sufficient to provide a chlorine content of not more than about 23 weight percent chlorine, based on the total weight of the polymer, followed by the sequential suspension chlorination of such polymer, in a substantially non-crystalline, particulate form, at a temperature above that employed for the herein described first chlorination and not more than about 150°C, for a period sufficient to provide a combined chlorine content of between about 25 and 50 weight percent, based on the total weight of the polymer.

Preferably, the polyolefinic materials to be chlorinated are those distinct species and varieties of essentially linear and unbranched highly porous, finely divided polymers containing at least about 90 mole percent ethylene in the polymer molecule with any remaining being one or more ethylenically unsaturated comonomers. Exemplary of such comonomers are the non-aromatic hydrocarbon olefins having 3 or more carbon atoms such as propylene, butene-1 and butene-2, and the like, cyclooctadiene and the like; substituted olefins such as acrylic acid and its esters; conjugated diolefins such as butadiene and the like; and the alkyl aromatic compounds such as styrene and its derivatives, among many other polymerizable materials known to the art.

Advantageously, the polymers and interpolymers, described herein, are prepared under the influence of catalyst systems comprising admixtures of strong reducing agents such as triethyl aluminum and compounds of Groups IV-B, V-B and VI-B metals of the Periodic System, such as titanium tetrachloride, and the like and are characterized by having molecular weights below about 1,000,000 and preferably from about 20,000 to 300,000. It is to be pointed out, however, that conventionally prepared low density, branched polyolefins may also be advantageously chlorinated by the process of the present invention, providing such materials are available in finely comminuted form. It is further to be pointed out that other ingredients such as pigments, stabilizers, lubricants and the like may be incorporated in the chlorinated olefin polymers, if desired.

Exemplary of particularly useful stabilizers are those materials conventionally employed in the preparation...
of vinyl polymer and copolymer film compositions, e.g., organic complexes and/or salts of lead, barium, cadmium, zinc, sodium, etc., and particularly the sulfur containing organo tin compounds including the alkyl tin mercaptides as well as dibutyl tin maleate, among others.

Although the chlorinated olefin polymers utilized to prepare the reclosable sealing means of the present invention are inherently flexible and self-adhering, it may, in some instances, be desirable to include in such chlorinated olefin polymer compositions from between about 1 and 15 parts per 100 parts of polymer, of a plasticizing agent to enhance the blocking or self-sealing characteristics of films prepared therefrom, and/or to enhance the ability of such films to adhere, in the absence of adhesives and the like, to the substrate of which the bag or pouch is composed. Suitable plasticizers include those materials conventionally employed for vinyl polymers, e.g., dioctyl phthalate and dibutyl sebacate, among many others known to the art.

Films or strips prepared from such chlorinated olefin polymers have been found to be uniquely self-adherent under normal conditions of temperature and pressure, and may in fact, be firmly but releasably sealed together by application of normal digital pressure, e.g., the manual pressure employed for sealing of a conventional envelope used for the mailing of letters, etc.

Further, the films or strips may be easily applied in essentially non-release contact with flexible, heat-sealable surfaces of the materials forming the body of the bag or pouch structures described herein by application thereof under conditions of temperature and pressure, normally employed for heat sealing of such materials. Further, when applying the sealing strips described herein to relatively rigid, non-heat-sealable materials, such as cardboard and the like, use may be made of conventional adhesives including organic solvent dispersions of the chlorinated olefin polymers described herein, or other securing means.

By way of example, a chlorinated polyethylene having a chlorine content of about 36 weight percent and a relative crystallinity of about 3.5 percent, was prepared by the chlorination, in aqueous suspension, of an essentially linear polyethylene having a melt index of about 1.0, utilizing the chlorination procedures as hereinbefore specifically described. The so-formed chlorinated polymer was then extruded through a film die having a thickness of about 0.001 of an inch, then coated without substantial orientation and cut into individual strips about 6 inches in length and about 0.5 of an inch wide. The strips were then joined to a conventional polyethylene pouch, in the positions as illustrated in FIGURES 1 and 2 of the drawing, by passing the opposed surfaces of the strips and pouch between heating elements operating at a temperature of about 190°C, wherein such surfaces were subjected to pressures of from about 10 to 15 p.s.i. for periods of from about 1 to 3 minutes. Following application, and after cooling of the film materials, it was found that the chlorinated polyethylene strips could not be manually separated from the polyethylene pouch. It was also found that the pressing together of the opposed surfaces of the chlorinated polyethylene strips, using normal finger pressure, resulted in a firm union which could be easily separated and reclosed many times without loss in sealing efficiency.

It is to be understood that the sealing conditions described herein will vary somewhat according to the nature and composition of the sealing strips and the bag or pouch material employed.

It is to be understood that the foregoing description has been given in detail without thought of limitation, other than as set-forth in the appended claims, since the inventive principles involved are capable of assuming other forms without departing from the spirit or scope of the invention.

What is claimed is:

1. Reclosable sealing means for containers comprising: individual inherently flexible, self-adhering film strips each of which is permanently attached to an external surface of said container, said film strips being formed from an essentially linear chlorinated olefin polymer containing from about 25 to about 50 weight percent of chemically combined chlorine, said film strips being positioned on said container so that the container is in a closed condition when the exposed surfaces of said film strips are in overlying contact.

2. The sealing means of claim 1 wherein said chlorinated olefin polymer is chlorinated polyethylene prepared in aqueous suspension and is characterized by having a relative crystallinity of between about 15 and 28 percent when containing about 25 weight percent chlorine and a relative crystallinity of less than 10 percent when containing about 34 weight percent chlorine.

3. A container having reclosable sealing means thereon, said sealing means comprising: individual inherently flexible, self-adhering film strips each of which is permanently attached to an external surface of said container, said film strips being formed from an essentially linear chlorinated olefin polymer containing from about 25 to about 50 weight percent of chemically combined chlorine, said film strips being positioned on said container so that the container is in a closed condition when the exposed surfaces of said film strips are in overlying contact.

4. The container of claim 3 wherein said container is a reclosable flexible pouch.

5. The container of claim 4 wherein said reclosable flexible pouch has front and back opposed walls wherein the back wall is extended to provide a sealing flap and wherein at least one film strip is positioned along the inner sealing margin of the flap and at least one film strip is positioned on the front wall adjacent the mouth of the pouch.

6. The container of claim 5 wherein said flexible pouch is a polyethylene pouch and said film strips are formed from chlorinated polyethylene prepared in aqueous suspension and characterized by having a relative crystallinity of between about 15 and 28 percent when containing about 25 weight percent chlorine and a relative crystallinity of less than 10 percent when containing about 34 weight percent chlorine.

7. The container of claim 6 wherein said film strips are in heat-sealed lamination with said polyethylene pouch.

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