FORM 1

SPRUSON & FERGUSON

634038

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

APPLICATION FOR A STANDARD PATENT

Minnesota Mining and Manufacturing Company, incorporated in Delaware, of 3M Center, Saint Paul, Minnesota 55144-1000, UNITED STATES OF AMERICA, hereby apply for the grant of a standard patent for an invention entitled:

Adhesive-backed Film Composite which can Become Permanently Bonded to a Plasticized Substrate

which is described in the accompanying complete specification.

Details of basic application(s):-

Basic Applic. No:	Country:	Application Date:
513,679	US	24 April 1990

The address for service is:-

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DATED this EIGHTEENTH day of MARCH 1991

Minnesota Mining and Manufacturing Company

By: J. [illegible]

Registered Patent Attorney

TO: THE COMMISSIONER OF PATENTS
OUR REF: 158167
S&F CODE: 58400

S020632 19/03/91

5845/2

Spruson & Ferguson

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AUSTRALIA CONVENTION STANDARD & PETTY PATENT DECLARATION SFP4

COMMONWEALTH OF AUSTRALIA

THE PATENTS ACT 1952

DECLARATION IN SUPPORT OF A CONVENTION APPLICATION FOR A PATENT

In support of the Convention Application made for a patent for an invention entitled: Adhesive-backed Film Composite which can Become Permanently Bonded to a Plasticized Substrate

Title of Invention

I/~~We~~ Gary L. Griswold

Full name(s) and address(es) of Declarant(s)

care of Minnesota Mining and Manufacturing Company
3M Center, St Paul, Minnesota 55144-1000
United States of America

do solemnly and sincerely declare as follows:-

Full name(s) of Applicant(s)

1. ~~I am/We are the applicant(s) for the patent~~

(or, in the case of an application by a body corporate)

1. I am/~~We are~~ authorised by MINNESOTA MINING AND MANUFACTURING COMPANY

the applicant(~~s~~) for the patent to make this declaration on its/~~their~~ behalf.

2. The basic application(~~s~~) as defined by Section 141 of the Act was/~~were~~ made

Basic Country(ies)

in United States of America

Priority Date(s)

on 24 April 1990

Basic Applicant(s)

by Susan Z. Paquette and Michael D. Crandall

Full name(s) and address(es) of Inventor(s)

3. ~~I am/We are the actual inventor(s) of the invention referred to in the basic application(s)~~

(or where a person other than the inventor is the applicant)

3. Susan Zirbel Paquette and Michael Drew Crandall

both care of Minnesota Mining and Manufacturing Company
3M Center, St Paul, Minnesota 55144-1000,
United States of America

(respectively)

is/are the actual inventor(s) of the invention and the facts upon which the applicant(~~s~~) is/~~are~~ entitled to make the application are as follows:

Set out how Applicant(s) derive title from actual inventor(s) e.g. The Applicant(s) is/are the assignee(s) of the invention from the inventor(s)

The said Company is the assignee of the actual inventors.

4. The basic application(~~s~~) referred to in paragraph 2 of this Declaration was/~~were~~ the first application(~~s~~) made in a Convention country in respect of the invention (~~s~~) the subject of the application.

Declared at Saint Paul this 6th day of February 19 91
Minnesota U.S.A.

Gary L. Griswold
Signature of Declarant(s)
Chief Intellectual Property Counsel

SFP4 To: The Commissioner of Patents 11/81

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(12) PATENT ABRIDGMENT (11) Document No. AU-B-73628/91
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 634038

(54) Title
ADHESIVE-BACKED FILM COMPOSITE WHICH CAN BECOME PERMANENTLY BONDED TO A PLASTICIZED SUBSTRATE

International Patent Classification(s)
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(56) Prior Art Documents
US 4605592

(57) Claim

1. An adhesive-backed film composite comprising a thin flexible backing which bears a layer of adhesive that is resistant to migratable monomeric plasticizer, thus enabling the film composite to become permanently bonded to substrates containing monomeric plasticizer, said adhesive comprising an acrylic emulsion polymer has a calculated T_g of 0 to -50°C and consists essentially of

(a) from 88 to 98 % by weight of an acrylic acid ester of a nontertiary alcohol, the alkyl groups of which contain 2 to 4 carbon atoms, and

(b) from 12 to 2% by weight of an ethylenically unsaturated, copolymerizable monomer, wherein said monomer is selected from the group consisting of acrylic acid, methacrylic acid, acrylamide, methacrylamide, itaconic acid, acrylonitrile, methacrylonitrile, methylmethacrylate, vinyl acetate, N-vinyl pyrrolidone, and styrene sulfonate

wherein said emulsion polymer has been coated from an aqueous emulsion.

6. A laminate of vinyl substrate containing migratable plasticizer and an adhesive-backed film composite comprising a thin flexible backing selected from vinyl, polyurethane, and polyolefin films, which backing bears a layer of adhesive that

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is resistant to migratable plasticizer, said adhesive comprising an acrylic emulsion polymer consisting essentially of

(a) from 88 to 98 % by weight of an acrylic acid ester of a nontertiary alcohol, the alkyl groups of which contain 2 to 4 carbon atoms, and

(b) from 12 to 2 parts by weight of an ethylenically unsaturated, copolymerizable monomer, wherein said monomer is selected from the group consisting of acrylic acid, methacrylic acid, acrylamide, methacrylamide, itaconic acid, acrylonitrile, methacrylonitrile, methylmethacrylate, vinyl acetate, N-vinyl pyrrolidone and styrene sulfonate

wherein said emulsion polymer has been coated onto the backing from an aqueous emulsion.

8. A method of making an adhesive-backed film composite comprising the steps:

(1) applying a coating of adhesive from an aqueous emulsion to a thin flexible backing wherein said adhesive comprises an acrylic polymer having a calculated T_g of 0°C to -50°C and consists essentially of

(a) from 88 to 98 % by weight of an acrylic acid ester of a nontertiary alcohol, the alkyl groups of which contain 2 to 4 carbon atoms, and

(b) from 12 to 2 parts by weight of an ethylenically unsaturated, copolymerizable monomer, wherein said monomer is selected from the group consisting of acrylic acid, methacrylic acid, acrylamide, methacrylamide, itaconic acid, acrylonitrile, methacrylonitrile, methylmethacrylate, vinyl acetate, N-vinyl pyrrolidone, and styrene sulfonate.

(2) drying the coating to provide an adhesive layer.

S & F Ref: 158167

FORM 10

634038

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

COMPLETE SPECIFICATION

(ORIGINAL)

FOR OFFICE USE:

Class Int Class

Complete Specification Lodged:
Accepted:
Published:

Priority:

Related Art:

Name and Address of Applicant: Minnesota Mining and Manufacturing Company
3M Center
Saint Paul Minnesota 55144-1000
UNITED STATES OF AMERICA

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Sydney, New South Wales, 2000, Australia

Complete Specification for the invention entitled:

Adhesive-backed Film Composite which can Become Permanently Bonded to a Plasticized Substrate

The following statement is a full description of this invention, including the best method of performing it known to me/us

5845/3

Abstract of the Disclosure

A film composite has a thin flexible polymeric backing bearing a layer of adhesive which is an acrylic emulsion polymer that is resistant to migratable monomeric plasticizer. A preferred adhesive is a copolymer of ethyl acrylate, n-butyl acrylate, and acrylic acid. Even though it may be nontacky or lightly tacky, it adheres under fingertip pressure to, and can remain permanently bonded to, highly plasticized substrates such as vinyl films containing migratable monomeric plasticizers. Such substrates include vinyl coated papers, fabrics, and scrims. Useful backings include vinyl, polyurethane, and polyester films.

ADHESIVE-BACKED FILM COMPOSITE WHICH CAN BECOME PERMANENTLY BONDED TO A PLASTICIZED SUBSTRATE

Background of the Invention

Field of the Invention

The invention is concerned with a flexible, adhesive-backed film composite that has an adhesive layer by which it can become permanently bonded to substrates containing migratable monomeric plasticizers, in spite of the tendency of such plasticizers to migrate into and to soften the adhesive. The invention is particularly concerned with the adhesive layer of such a film composite.

Description of the Related Art

As is pointed out in U.S. Pat. No. 4,605,592 (Paquette et al.), highly plasticized vinyl substrates previously had been decorated by hand painting or air brushing screen-printing inks. While prefabricated graphics in the form of adhesive-backed vinyl film bearing screen-printed graphics would have been less expensive, they had not been adapted for such use "due to the wrinkling of the vinyl film and loss of adhesion to the vinyl substrate ... attributable, at least in part, to the migration of monomeric plasticizers from the vinyl substrate into the vinyl film and adhesive" (col. 1, lines 24-33). These vinyl substrates contain as much as 25-100 parts of monomeric plasticizer, usually dioctylphthalate, to 100 parts of vinyl resin.

In general, low-cost monomeric plasticizers are more migratory than are those of higher cost, so that

attempts by manufacturers of plasticized substrates to economize often exacerbate the problem of adhering a decorative, adhesive-backed flexible film to those substrates.

The Paquette patent provides a decorative, adhesive-backed vinyl film composite that is capable of maintaining adhesion and remaining substantially wrinkle free when adhered to vinyl substrates that contain migratable monomeric plasticizer. The decorative film composite of the Paquette patent has (1) a polyvinyl chloride film layer that preferably is receptive to screen printing inks, (2) a layer of a plasticizer-resistant pressure-sensitive adhesive, e.g., a terpolymer of by weight 52.5 parts of n-butylacrylate, 37.5 parts methyl acrylate, and 10 parts acrylic acid, and (3) an intermediate, migratable-plasticizer barrier layer such as an aliphatic polyurethane resin. After being coated and dried, the adhesive can be crosslinked, e.g., by exposure to UV radiation when it contains a photocrosslinker such as benzophenone, thus making the adhesive layer more resistant to any plasticizer that migrates from a vinyl substrate. The pressure-sensitive adhesives of the examples of the Paquette patent are polymerized in solution and coated from solution.

Summary of the Invention

The present invention provides an adhesive-backed film composite which, like the film composite of the Paquette patent, has a thin, flexible backing that can be decorative. Like the film composite of the Paquette composite, the adhesive layer of the novel film composite is based on an acrylic polymer and can be pressure-sensitive, although it does not need to be tacky to the touch at ordinary room temperatures, and even when its adhesive layer is nontacky to the touch, the novel film composite becomes permanently bonded at room temperature

under fingertip pressure to highly plasticized substrates such as vinyl films or vinyl coated papers, fabrics or scrims containing migratable monomeric plasticizer. Such substrates are used extensively, e.g., as wall coverings, soft sided truck coverings, flexible signs and awnings. Because the adhesive is resistant to plasticizers even without crosslinking, the manufacturing expense and lowered adhesion values associated with crosslinking can be avoided.

Briefly, the film composite of the invention has a thin, flexible backing which bears a layer of adhesive comprising an acrylic emulsion polymer of

a) from 84 to 100 parts of acrylic acid ester of nontertiary alcohol, the alkyl groups of which contain a weight average of at least 2 and up to about 5 carbon atoms, and

b) correspondingly from 16 to 0 parts by weight of an ethylenically unsaturated, copolymerizable monomer,

which polymer has been coated from an aqueous emulsion.

If the alkyl groups of the acrylic polymer had substantially greater than a weight average of five carbon atoms, the adhesive would have significantly less resistance to migratable monomeric plasticizers. If that average were substantially less than two, the adhesive would not form strong bonds to plasticized substrates under fingertip pressure at ordinary room temperatures. Optimum resistance to migratable monomeric plasticizer is achieved when the relationship of said average number of carbon atoms in the alkyl groups is from 2 to 4, more preferably from 2 to 3. By keeping that average low, the adhesive tends to have low initial adhesion values, thus enhancing repositionability, but adhesion tends to build to a desirably high level within a reasonably short period of time. Furthermore, adhesives wherein said average

number of carbon atoms is low tend to have superior resistance to shear forces.

When the above-identified monomer a) or blend of monomers a) and b) is or are emulsified in a surfactant system with a free-radical initiator, polymerization readily proceeds to completion (>98% conversion) at moderately elevated temperatures, and an inherent viscosity (IV) of greater than 5.0 is readily attained without further processing. When the resulting latex is filtered, typically less than 0.01 g of coagulum per 1000 g latex is collected.

By coating the adhesive from an aqueous emulsion, the trouble and expense of inverting to solution is avoided, and it is unnecessary to employ apparatus to prevent volatiles from polluting the atmosphere.

Because the acrylic polymer is polymerized from aqueous emulsion, it has sufficiently high inherent viscosity to be useful in the novel film composite without further processing, whereas a polymer of the same monomers prepared from solution would typically have much lower molecular weight and would need to be cured (e.g., by ultraviolet radiation) to attain a satisfactorily high inherent viscosity. Furthermore, the emulsion-coated adhesive can have adhesive values equal to or greater than can be attained with a solvent-based adhesive that is otherwise identical in composition but is half again greater in thickness. Such a substantial reduction in thickness not only entails economy of raw material, but thinner adhesive layers reduce the incidence of edge-oozing that could attract dirt and also detract from the otherwise decorative nature of the novel film composite.

Homopolymers of monomer a) provide adhesives by which a flexible backing can become permanently bonded to substrates containing migrating monomeric plasticizers. However, acrylic copolymers of monomers a) and b) afford

stronger bonds to plasticized substrates, especially when monomer b) is highly polar, and there is no current economic advantage in avoiding the use of a highly polar monomer b). Useful highly polar monomers include acrylic acid, methacrylic acid, acrylamide, methacrylamide, acrylonitrile, methacrylonitrile, and itaconic acid. Other useful copolymerizable monomers b) include methylmethacrylate, vinyl acetate, N-vinyl pyrrolidone, and styrene sulfonate.

Preferred monomers a) are ethyl acrylate and n-butyl acrylate, both of which are commercially available in good quantities and at reasonable cost. Propyl acrylates are not readily available in commerce.

Preferred adhesives of the film composite of the invention are provided by acrylic copolymers of, by weight

from 50 to 90% of ethyl acrylate,
from 10 to 50% of n-butyl acrylate, and
from 1 to 16% of a copolymerizable, highly polar monomer.

Optimum resistance to migratable plasticizers is achieved when at least 65% of ethyl acrylate is employed.

More preferably, the amount of monomer b) is from 2 to 12 parts by weight. At amounts substantially above that preferred range, the adhesive tends to be too firm to enable good bonds to be formed under fingertip pressure. At amounts below that preferred range, the adhesive tends to be somewhat soft and to form bonds that are weaker than are those produced with larger amounts of monomer b).

When the inherent viscosity (IV) of the acrylic polymer is more than 5.0, it resists swelling that otherwise might occur when the plasticizer resistant novel film composite is adhered to a substrate containing migratable monomeric plasticizer. On the other hand, acrylic polymers of lower IV have higher aged adhesion values to plasticized substrates. Crosslinking further

improves resistance to swelling but can reduce adhesion to some plasticized substrates to unacceptable levels.

Preferably, the acrylic polymer has a calculated Tg of from 0° to -50°C. If its Tg were substantially above that preferred range, the adhesion of the novel film composite might fail at low temperatures upon being subjected to stresses such as from impact or vibrations. If its Tg were substantially below that preferred range, the adhesive layer of the novel film composite might be too tacky to permit it to be repositioned before it has been pressed into full contact with a substrate. However, repositioning of a tacky adhesive can be provided by rupturable glass microbubbles as disclosed in U.S. Pat. No. 3,314,838 (Erwin). More preferably, the calculated Tg of the acrylic polymer is from -20° to -40°C.

Detailed Description

The flexible backing of the novel film composite preferably is a decorative polymeric film such as polyurethane, polyolefin, and plasticized vinyl or a soft metal such as aluminum. When the backing is a polyurethane film, it is more durable when it is aliphatic. Plasticized vinyl films are currently less expensive than polyurethane films and are widely used in the graphics industry because of their versatility, durability, and low cost. When the backing is a plasticized vinyl film, its plasticizer preferably is primarily a nonmigratable polymeric plasticizer. Preferred vinyl backings are disclosed in the Paquette patent and are available as SCOTCHCAL™ Film Series 3650 and CONTROLTAC™ Film Series 180 from 3M, to which the present application is assigned.

To better ensure against wrinkling, a novel film composite that has a vinyl backing preferably incorporates a barrier layer as disclosed in the Paquette patent, thus better protecting the film backing from becoming wrinkled

by migratable monomeric plasticizers of substrates to which the novel film composite may be adhered. When the IV of the acrylic polymer exceeds 5.0, there is less need for such a barrier layer.

To make the adhesive layer of the novel film composite even more effective in protecting the backing from migratable monomeric plasticizer, the acrylic emulsion polymer can be blended with a urethane heat-activatable latex adhesive such as a polyester-polyurethane latex (e.g., "Baybond" 402A from Mobay). Furthermore, such addition enhances repositionability and tends to increase adhesive values, a surprising result considering that urethane latex adhesives, when used alone, must be heat activated.

TESTING

180° Pullback Value

180° pullback adhesions are run according to ASTM D-1000, Method B, with an Instron tester. The adhesion tests are conducted on specimens after dwell as indicated.

In the following examples, all parts are by weight.

Example 1

A titanium dioxide pigmented, plasticized poly(vinylchloride) film 50 μm in thickness while supported by a paper carrier web was coated with a 40% solids aqueous emulsion of an acrylic emulsion copolymer of 80% ethyl acrylate, 16% n-butyl acrylate, and 4% acrylic acid. The coating was dried 10 minutes at 66°C to a dry coating weight of 25 mg/m^2. The adhesive side was then laminated to a silicone release liner, and the paper carrier web was discarded to provide an adhesive-backed film composite of the invention.

Example 2

An adhesive-backed film composite was made in the same manner as in Example 1 except using an acrylic emulsion copolymer of 74% ethyl acrylate and 26% n-butyl acrylate.

Example 3

A urethane backing was made by coating two layers of an aqueous polyurethane dispersion containing a predispersed pigment paste ("Disperse White" 00-2207 from BASF) on a paper casting liner. After drying the first layer, a second layer of the same material was coated over the first layer to produce a 65 μm thick film. Each coating was dried at room temperature for one minute and then in an oven at 66°C for 15 seconds and 121°C for 30 seconds. Over this urethane backing was coated a 40% solids aqueous emulsion of an emulsion copolymer of 68% ethyl acrylate, 26% n-butyl acrylate, and 6% acrylic acid. The coating was dried 10 minutes at 66°C to a dry coating weight of 25 mg/m^2.

Comparative Example A

An adhesive-backed film composite was made using an acrylic solution copolymer of 90% 2-methylbutyl acrylate and 10% acrylic acid, and coating this from a 49% solids solution onto a silicone release liner, followed by heating for 10 minutes at 66°C to a dry coating weight of 67 mg/m^2.

Testing of Examples 1-3

Each of the adhesive-backed film composites of Examples 1-3 and of Comparative Example A was tested for 180° Pullback Value from a vinyl substrate, viz., a poly(vinylchloride) coated polyester scrim containing

40-45 phr of monomeric plasticizer and having a weight of 19 ounces/yd^2 (650 g/m^2). Results are in Table I.

Table I

	180° Pullback Adhesion Value (N/cm)		
after	24 hr, R.T.	1 wk., 66°C	2 wk., 66°C
Film Composite of			
Example 1	9.6	8.9	9.3
Example 2	10.5	8.6	8.2
Example 3	7.2	9.8	9.6
Comp. Ex. A	10.7	3.5	3.3

Data of Table I show that the adhesive-backed film composites of Examples 1-3 retain good 180° Pullback Adhesion Values after accelerated aging, but that the composite of Comparative Example A, while having a satisfactory 180° Pullback Value after one day at room temperature experiences drastically reduced values after accelerated aging.

Example 4

An adhesive-backed film composite was made in the same manner as in Example 1 except that the acrylic emulsion copolymer was blended in equal parts solids with a 35% solids polyester-polyurethane latex ("Baybond" 402A from Mobay). The dried coating weight of the resulting adhesive layer was 25 mg/m^2.

The composite was tested for 180° Pullback Adhesion Values (N/cm) from a plasticized vinyl substrate, ("Duraskin" from Verseidag Industrie Textilien, West Germany) having a weight of 18 ounces/yd^2 (610 g/m^2). Table II reports the results afer the indicated dwell.

Table II

180° Pullback Adhesion Value (N/cm)

Initial	2 hr, R.T.	24 hr, R.T.	1 wk., 66°C	2 wk., 66°C
3.9	5.6	5.6	7.7	12.0

The relatively low initial adhesion reflects the good repositionability of the adhesive, but as shown after accelerated aging, adhesion built to a satisfactory level.

The claims defining the invention are as follows:

1. An adhesive-backed film composite comprising a thin flexible backing which bears a layer of adhesive that is resistant to migratable monomeric plasticizer, thus enabling the film composite to become permanently bonded to substrates containing monomeric plasticizer, said adhesive comprising an acrylic emulsion polymer has a calculated T_g of 0 to -50°C and consists essentially of

(a) from 88 to 98 % by weight of an acrylic acid ester of a nontertiary alcohol, the alkyl groups of which contain 2 to 4 carbon atoms, and

(b) from 12 to 2% by weight of an ethylenically unsaturated, copolymerizable monomer, wherein said monomer is selected from the group consisting of acrylic acid, methacrylic acid, acrylamide, methacrylamide, itaconic acid, acrylonitrile, methacrylonitrile, methylmethacrylate, vinyl acetate, N-vinyl pyrrolidone, and styrene sulfonate

wherein said emulsion polymer has been coated from an aqueous emulsion.

2. The adhesive-backed film composite as defined in claim 1 wherein said monomer (a) is ethyl acrylate, n-butyl acrylate, or a mixture thereof.

3. The adhesive-backed film composite as defined in claim 2 wherein said monomer (a) is a mixture of from 50 to 90% by weight of ethyl acrylate and from 50 to 10% by weight of n-butyl acrylate, such that the monomer (a) mixture is 88 to 98 % by weight of the acrylic emulsion polymer and said monomer (b) is 12 to 2% by weight of a highly polar monomer, wherein said polar monomer is selected from the group consisting of acrylic acid, methacrylic acid, acrylamide, methacrylamide, itaconic acid, acrylonitrile and methacrylonitrile.

4. The adhesive-backed film composite as defined in claim 3 wherein said monomer (a) mixture containing at least 65% by weight ethyl acrylate.

5. The adhesive-backed film composite as defined in claim 1 wherein said backing is selected from the group consisting of polyurethane, polyolefin, plasticize vinyl, and soft metal.

6. A laminate of vinyl substrate containing migratable plasticizer and an adhesive-backed film composite comprising a thin flexible backing selected from vinyl, polyurethane, and polyolefin films, which backing bears a layer of adhesive that is resistant to migratable plasticizer, said adhesive comprising an acrylic emulsion polymer consisting essentially of

(a) from 88 to 98 % by weight of an acrylic acid ester of a nontertiary alcohol, the alkyl groups of which contain 2 to 4 carbon atoms, and

(b) from 12 to 2 parts by weight of an ethylenically unsaturated, copolymerizable monomer, wherein said monomer is selected from the group consisting of acrylic acid, methacrylic acid, acrylamide, methacrylamide, itaconic acid, acrylonitrile, methacrylonitrile, methylmethacrylate, vinyl acetate, N-vinyl pyrrolidone and styrene sulfonate

wherein said emulsion polymer has been coated onto the backing from an aqueous emulsion.

7. The laminate as defined in claim 6 wherein said vinyl substrate comprises vinyl-coated paper, fabric, or scrim.

8. A method of making an adhesive-backed film composite comprising the steps:

(1) applying a coating of adhesive from an aqueous emulsion to a thin flexible backing wherein said adhesive comprises an acrylic polymer having a calculated T_g of 0°C to -50°C and consists essentially of

(a) from 88 to 98 % by weight of an acrylic acid ester of a nontertiary alcohol, the alkyl groups of which contain 2 to 4 carbon atoms, and

(b) from 12 to 2 parts by weight of an ethylenically unsaturated, copolymerizable monomer, wherein said monomer is selected from the group consisting of acrylic acid, methacrylic acid, acrylamide, methacrylamide, itaconic acid, acrylonitrile, methacrylonitrile, methylmethacrylate, vinyl acetate, N-vinyl pyrrolidone, and styrene sulfonate.

(2) drying the coating to provide an adhesive layer.

9. The method as defined in claim 8 wherein said backing is selected from vinyl, polyurethane, and polyolefin films.

10. The method as defined in claim 9 wherein said monomer (a) is selected from the group consisting of ethyl acrylate, n-butyl acrylate, and a mixture containing at least 50% by weight of ethyl acrylate and at least 10% by weight of n-butyl acrylate.

11. An adhesive-backed film composite substantially as described herein with reference to any one of the Examples other than comparative examples.

12. A method of making an adhesive-backed film composite, substantially as described herein with reference to any one of the Examples other than comparative examples.

DATED this FIRST day of DECEMBER 1992

Minnesota Mining and Manufacturing Company

Patent Attorneys for the Applicant
SPRUSON & FERGUSON