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Description

The present invention relates to a forensic evidence film according to the preamble of Claim 1 and to the use of such a forensic evidence film according to Claim 13.

The purpose of forensic evidence films is to secure the tiniest particles present on surfaces, especially traces from an accident involving motor vehicles, in order then to be able to subject them to a detailed investigation away from the accident site. Such forensic evidence films are, however, also suitable for example for securing fingerprints, etc.

One known forensic evidence film consists of a transparent plastic film which has been coated on one side with an adhesive, the adhesive properties of which have been set such that said adhesive picks up and retains the traces to be secured from the surface to be investigated, without removing surface coatings of the surface itself (paint layers, etc.). In order to render the films transportable before and after the securing of evidence, the known film is provided with a siliconized carrier paper onto which the film has been adhesively bonded and onto which said film is adhesively bonded again after the securing of evidence. As a result, the secured foreign particles are enclosed and retained from both two sides, and so the corresponding film can be shipped, archived, etc.

For evaluation, the forensic evidence film is generally examined through the transparent film visually, with or without the aid of a magnifying glass or a microscope. In the event of direct access to the foreign particles being necessary, for example for the purpose of chemical analyses, the carrier paper is removed. The carrier paper is also removed for a comparative examination of multiple films, since it is then possible to put the transparent films on top of one another (e.g. crosswise) and to thus make an optimal comparison of the comparative samples, for example under a microscope. However, in the carrier paper-absent state, there is the risk of contaminating foreign particles from

the place of examination or from other films inadvertently getting onto the forensic evidence film. Even if this can be avoided by a careful procedure, this risk is a possible detriment to the probative value of such film exhibits. Furthermore, in the event of any mix-ups of carrier papers, what may also occur is contamination of the films by particles possibly adherent on the carrier paper from another forensic evidence film, which would be fatal especially for comparative tasks. Moreover, the removal of the adhesive film from the carrier paper is sometimes difficult to accomplish under the conditions of use in a traffic accident, the conditions being exacerbated in many cases (weather conditions, darkness).

US 4 805 468 A describes a sheet of film for securing primarily traces of fibres, consisting of a transparent carrier film having a layer of adhesive and a transparent cover film.

WO 2009/108229 A2 discloses a sample collector and a sample housing for collection and analysis of microbiological samples.

WO 2014/146197 A1 discloses a narrow trace analysis film in which the film can be provided in roll form, from which individual sheets can be separated by means of perforations.

US 6 925 896 B1 relates to an evidence recovery sheet of about the size of a doormat that is laid out on the floor for investigation at an entryway to a crime scene to be forensically investigated, so that traces from a crime scene inadvertently adhering to the shoes or overshoes of the investigators are picked up by the sheet and/or so that contamination of the crime scene by inadvertently adherent traces that are “introduced” is avoided or such a situation is subsequently identifiable.

It is an object of the invention to improve a known forensic evidence film with respect to its manageability and evidence-preservation properties.

The aforementioned object is achieved by means of a forensic evidence film having the features of Claim 1 and the use of such a forensic evidence film according to Claim 13.

Advantageous embodiments are described in the dependent claims.

According to the invention, a forensic evidence film, especially for securing evidence in the event of vehicle accident damage, comprises the following:

- an adhesive film which has a transparent plastic carrier film and an adhesive layer applied thereto on one side, the adhesive layer being designed to pick up and preserve traces from a trace location, and
- a separating cover sheet which is designed to cover the adhesive layer in the pre-use state and in the storage state at least in partial areas in a removable manner and which has at least on its side facing the adhesive layer a siliconized coating or a surface quality non-destructively separable from the adhesive layer in some other way.

According to the invention, the separating cover sheet is designed as a highly transparent film at least in partial areas, which enables the adhesive film provided with the separating cover film to be examined even through the separating cover film after the securing of evidence.

As a result, removal of the separating cover film is only necessary for chemical/analytical purposes for example, and the secured foreign particles can be examined from both sides visually – including with the aid of a light microscope –through the transparent forensic evidence film and the transparent separating cover film. Sample comparison is possible without any problems, too, by superimposition of exhibits enclosed in a "film sandwich" according to the invention (e.g. in the form of a cross), without the risk of mutual contamination of the exhibits.

Furthermore, the forensic evidence film has essentially a rectangular basic cut with longitudinal and narrow sides, a connection between the adhesive film and the separating cover sheet being provided on one longitudinal side, in particular by film welding or by application of an adhesive, which connection is essentially non-stop and firm, is generally not mechanically undoable without destruction of the films and is essentially linear. As a result, the separating cover sheet and the adhesive film are captive with respect to one another, meaning that a mix-up of different separating cover sheets is hardly possible any longer and the handling of the forensic evidence film is facilitated overall because the separating cover sheet can no longer be lost, for example can no longer be blown away in the event of a relatively strong draught of air at the accident site.

In a preferred embodiment, the adhesive film has, in order to obtain the firm connection to the separating cover sheet, a strip-shaped section folded over in the direction of the adhesive layer by about 180° onto the side of the adhesive layer, wherein the adhesive layer there adhesively bonds the adhesive film to the side of the separating cover sheet that is facing away from the side that is siliconized or coated in some other way, wherein this other side of the separating cover sheet is generally uncoated or is designed with respect to a relatively firm adhesive bond (e.g. slightly roughened). Alternatively, what can also be provided is that, conversely, the separating cover sheet has a section folded over by about 180°, the result being that the (generally uncoated) side of the separating cover sheet that is facing away from the side that is siliconized or coated in some other way is likewise adhesively bonded to the adhesive layer.

The firm connection is therefore realized without using additional adhesives and without measures such as film welding or the like, by the adhesive which is applied anyway to the adhesive film for securing of evidence being used for adhesive bonding to the reverse side of the separating cover sheet that

is not siliconized (or made anti-adhesive in some other way), by the adhesive film being appropriately folded over. It has been found that the adhesive effect thus achieved is entirely sufficient for rendering the separating cover sheet removable only with great difficulty. Additional measures such as welding or use of a relatively strong adhesive are possible.

In order to improve the practical manageability of the forensic evidence film, the adhesive film and/or the separating cover sheet can be designed for application of identification labels. Furthermore, optical identification features, pre-printed at regular intervals, for unambiguous identifiability of the section of forensic evidence film used, in particular unambiguous identification numbers or barcodes, can be present.

Furthermore, the manageability of the forensic evidence film can be improved by cancelling, in the case of a forensic evidence film having essentially a rectangular basic cut with longitudinal and narrow sides, the effect of the adhesive layer at the edge on a longitudinal side opposite to a possibly present firm connection between the adhesive film and the separating cover sheet. This creates a flap, also referred to as a “finger find”, which allows simple detachment of the adhesive film from the separating cover sheet.

Preferably, to cancel the effect of the adhesive layer, an essentially non-transparent material strip, in particular a paper strip, can be firmly connected to the adhesive layer in the edge region. Said paper strip can be adhesively bonded onto the adhesive layer in a simple manner and can thus serve as a “finger find”.

At the same time, what can be provided is that the separating cover sheet on the side of the essentially non-transparent material strip does not extend up to the edge of the adhesive film but ends in the area of the essentially non-transparent material strip; preferably in such a way that the corresponding end edge of the separating cover sheet essentially aligns with

the inside end edge of the material strip. What is thereby avoided is the separating cover sheet being present as a free flap without an adhesive connection in the area of the "finger find", thereby counteracting problems in the handling of the film, for example fold-down or formation of folds during insertion into a plastic pocket. Furthermore, the handling of the "finger find" is improved as a result, since the material strip applied to the adhesive film reinforces it and thus makes it possible for said material strip to be bent for partial removal of the film and for the separating cover sheet to be thus removed from the adhesive film in the border region adjacent to the material strip.

Furthermore, this shortened separating cover sheet facilitates the use of the material strip for labelling purposes, since the material strip is exposed on one side as a result. To this end, the essentially non-transparent material strip can, on its side accessible through the recessed separating cover sheet, be designed for permanent reception of a label by means of pencil, ballpoint pen, felt-tip pen or the like.

In a preferred embodiment, the forensic evidence film can have a significantly larger longitudinal extension than width extension in the pre-use state, and one or more perforations, in particular micro-perforations, are present transversely to the longitudinal extension for easy separability of individual sections of forensic evidence film.

In this case, the forensic evidence film can preferably be designed as a rolled product in the pre-use state.

Furthermore, the selection and dimensioning of the materials for a forensic evidence film according to the invention can – without restriction to these details and materials – be such that

- the transparent plastic carrier film of the adhesive film is made of PP (polypropylene), preferably with a layer thickness of approx. 50 µm, and/or

- that the adhesive layer is essentially formed from a water-soluble adhesive, and/or
- that the separating cover sheet is essentially made from a PET film, preferably with a layer thickness of approx. 50 µm, and/or
- that the separating cover sheet is siliconized at least on the side facing the adhesive layer to produce the separating effect.

In this connection, the adhesive layer can have a thickness of 10 µm to 100 µm, preferably of 10 µm to 30 µm, particularly preferably of approximately 18 µm with a tolerance of approximately ± 2 µm.

The adhesive layer can furthermore be set in such a way that the secured traces can be removed by means of a solvent, in particular the so-called Turkish Solvent.

The forensic evidence film according to the invention can be stored in a matched archiving aid comprising a support designed for filing into a file of customary format, the support having provided thereon one or more, preferably two, preferably transparent pockets for accommodation of one or more forensic evidence films, which pockets are closable by means of sealable flaps such that there is no possibility of forensic evidence films falling out, of forensic evidence films from different pockets making contact, and of forensic evidence films being removed without damage to the pockets and, optionally, without seal breakage.

The forensic evidence film according to the invention has preferably a possible use in a method for securing evidence of vehicle accident damage using a forensic evidence film comprising the following steps:

a) tailoring the forensic evidence film depending on the geometry of the trace location to be secured,
b) at least partially removing the separating cover sheet,

c) applying the adhesive layer to the trace location to secure the traces and removing same, and

d) reapplying the separating cover sheet.

In one embodiment, what can be provided is an additional step of photographing the forensic evidence film applied to the trace location together with at least one identifying feature present on the film or previously applied thereto, which identifying feature allows a later identification of the section of forensic evidence film applied to the trace location.

Furthermore, what can be provided as an additional step is archiving of the forensic evidence films belonging to one accident event in at least two separate and respectively sealable pockets, one or more pockets being applied to an archiving aid designed for filing into a file of customary format.

The invention will be more particularly elucidated below on the basis of an exemplary embodiment depicted in the drawing.

The single figure shows a schematic sectional view of a forensic evidence film according to the invention, which sectional view is not true to scale for illustrative purposes and is referred to as a whole by 32. Here, the sectional view is set in the transverse direction. In the longitudinal direction perpendicular to the section plane, the forensic evidence film 32 can be formed as an elongated rolled product which has micro-perforations at regular intervals and rectangular sections can therefore be separated. What can also be provided is that the user makes whatever is the required length himself using a pair of scissors or a cutting machine or the like. The preferred width of the forensic evidence film is 170 mm, though other widths are self-evidently also possible.

The forensic evidence film 32 consists of a highly transparent carrier film 10 composed of polypropylene (PP) having a material thickness of approx. 50 µm (micrometres) and two-sidedly smooth

film surfaces. The carrier film 10 obtains adhesive properties through a uniformly applied adhesive layer 12 of a water-soluble adhesive. The carrier film 10 and carrier layer 12 together are also referred to hereinafter as adhesive film 34.

The thickness of the adhesive layer (not depicted true to scale here) is preferably approx. 18 µm ± 2 µm. In the case of such layer thicknesses, the adhesive layer 12 does not affect or hardly affects the degree of transparency of the sheet of film. Together with the adhesive properties and the stiffness of the carrier film 10, the adhesive layer 12 is set in such a way that, upon application to a location for securing of evidence, foreign bodies to be secured are taken off and retained thereby in their original position, and from this it is then later possible to derive not only information about the nature of the foreign bodies themselves, but also about the kinematics of an accident (relative speeds, etc.).

The adhesive film 34 is covered by a separating cover sheet 14 in the pre-use state and after-use state. This is preferably a PET (polyethylene terephthalate) film 14 of preferably likewise approx. 50 µm in thickness that is somewhat more elastic compared to the carrier film 10, is likewise highly transparent and is provided with smooth surfaces. Said film is one-sidedly provided on the side facing the adhesive film 34 with a siliconization layer 16 (layer thickness typically a few µm, not depicted true to scale) which is firmly adherent on the film 14 and which likewise does not appreciably influence the degree of transparency of the film 14. The siliconization layer 16 means that the film 14 – apart from the right edge region elucidated below – can be removed from the adhesive layer 12 of the carrier film 10 without any problems and without destruction, possibly also multiple times, as indicated by the arrow 22, and also be reapplied there, the result being that now secured foreign bodies retained in the area of the top side 20 of the adhesive layer 12 are practically not compromised.

The separating cover film 14 does not extend over the entire width of the carrier film 10. Specifically, at the left edge in the exemplary embodiment, the adhesive layer 12 of the film has adhesively bonded thereon a non-transparent paper strip 18 which cancels the adhesive effect there, and the separating cover film 14 extends only up to the edge of said paper strip 18. The paper strip 18 is typically approx. 15 mm in width. Instead of a paper strip, it is in principle also possible to use other film-type sheets, such as plastic films for example, which cancel the adhesive effect there.

Said paper strip 18 has multiple functions: firstly, as part of a so-called “finger find”, it facilitates the detachment of the separating cover film 14 from the adhesive film 34, since the paper strip 18, through the increase in stiffness of the film in the area thereof, facilitates bending of the adhesive film 34, whereupon the separating cover film 14 is detached from the adhesive layer and can then be easily grasped. Optionally, this process can be further facilitated by the separating cover film 14 overlapping the paper strip 18 by a few millimetres, so that it is positioned a little in this area (not depicted).

Furthermore, the paper strip 18 offers a convenient possibility of labelling the forensic evidence film 32 using all customary labelling means, which do not need to be waterproof or permanent, i.e. pencil, ballpoint pen or felt-tip pen, etc. Labelling is also simplified by the corresponding top side 26 of the paper strip 18 being exposed as a result of the shortening of the separating cover film 14. On the bottom side 24 of the paper strip that is adherent on the adhesive layer 12, a printed label can be attached, for example a description of the type of forensic evidence film and optionally coding of the sections of film by means of a consecutive number or a barcode. The transparent adhesive film 34 means that this label or this print on the bottom side 24 of the paper strip 18 is visible and simultaneously protected. If a material other than paper is used for the strip 18, it can be made writable using conventional (non-permanent) writing aids by a suitable coating, for example

by a gelatin layer applied on the top side. Besides the advantages that have already described, the paper strip 18 has the further advantage that this optically noticeable strip 18 provides a simple orientation point for the alignment of the film or of the reproduction of the alignment of the film 32.

On the right-hand side in the figure, the adhesive film 34 and separating cover film 14 are captively connected to one another. This is achieved by a fold-over 28 of the adhesive film 34 by approx. 180°. The specification 180° is based on the pre-use or after-use state of the film, in which the films 34 and 14 adhesively bond on top of one another in the manner of a sandwich; when the film 14 is removed in the arrow direction 22, the connection 28 yields a kind of hinge. The stated fold-over 28 encompasses the separating cover film 14 in a strip-shaped section of preferably approx. 7 mm in width, with the result that the adhesive layer 12 is in contact with the non-siliconized top side 30 of the separating cover film 14 and establishes there an adhesive connection that is difficult to undo.

This is depicted merely schematically in the drawing; instead of the angular course of the film that is depicted, what will appear in reality is a U-shaped or V-shaped form.

It has been found that this adhesive connection is sufficiently firm to virtually rule out inadvertent complete removal or loss of the separating cover film 14. In this way, the existing adhesive layer 12 has, in addition to the evidence-securing function, multiple uses at the same time, one for accommodation and fixation of the paper strip 18 and the other for establishment of a captive lateral connection to the separating cover film 14.

It is self-evident that other possibilities of connection between the carrier film 10 and separating cover film 14 are also conceivable, for example thermal welding, a stamped connection, a clamp connection or the application of a separate adhesive.

SPORSIKRINGSFOLIE

Patentkrav

1. Sporsikringsfolie (32), navnlig til sporsikring ved ulykkesskader på fartøjer, med
- en klæbefolie (34), som har en transparent kunststofbærefolie (10) og et herpå på en side påført klæbelag (12), idet klæbelaget (12) er udformet således, at det løsner og konserverer spor fra et sporsted, og
- en skilleafdækningsfilm (14), som er udformet, så den i en tilstand før brug samt i opbevaringstilstand i det mindste i delområder kan fjernes til afdækning af klæbelaget (12), og den i det mindste på den side, der vender mod klæbelaget (12), har en silikoniseret belægning (16) eller en overfladebeskaffenhed, som på anden måde kan skilles ikke-destruktivt fra klæbelaget, idet
skilleafdækningsfilmen (14) i det mindste i delområder er udformet som højtransparent folie, som muliggør en undersøgelse af den med skilleafdækningsfolien (14) forsynede klæbefolie (32) efter sporsikringen også gennem skilleafdækningsfolien (14),
kendetegnet ved, at
sporsikringsfolien (32) i det væsentlige er udformet med en rektangulær grundtilskæring med lange og smalle sider, og at skilleafdækningsfilmen (14) er forbundet med klæbefolien (34) på en lang side ved hjælp af en i det væsentlige gennemgående og fast og i det væsentlige lineær forbindelse (28), som mekanisk ikke kan tages af uden at ødelægge folierne, navnlig ved hjælp af et klæbestof eller en foliesvejsning.

2. Sporsikringsfolie (32) ifølge krav 1,
kendetegnet ved, at
klæbefolien (34) til etablering af den faste forbindelse med skilleafdækningsfilmen (14) har et strimmelformet, afsnit (28) ombukket ca. 180° i retning mod klæbelaget på siden af klæbelaget, idet klæbelaget (12) klæber klæbefolien (34) sammen med den side, der vender væk fra den silikoniserede

eller på anden måde belagte side (30) af skilleafdækningsfilmen (14), eller at adskillelsesafdækningsfilmen omvendt har et afsnit, der er ombukket ca. 180°, således at den side af det ombukkede område på skilleafdækningsfilmen, der vender væk fra den silikoniserede eller på anden måde belagte side, klæber sammen med klæbelaget.

3. Sporsikringsfolie (32) ifølge krav 1 oder 2, kendetegnet ved, at klæbefolien (34) og/eller skilleafdækningsfilmen (14) er udformet til at påføre identifikationspåtegninger, og/eller at der med regelmæssige mellemrum er tilvejebragt fortrykte, optiske identifikationskendetegn til en entydig identifikationsmulighed af det anvendte sporsikringsfolieafsnit, navnlig entydige identifikationsnumre eller stregkoder.

4. Sporsikringsfolie (32) ifølge et af kravene 1 til 3, kendetegnet ved, at sporsikringsfolien (32) i det væsentlige er udformet med en rektangulær grundtilskæring med lange og smalle sider, og at virkningen af klæbelaget (12) i kanten er ophævet på en lang side, som ligger over for en i givet fald eksisterende fast forbindelse (28) mellem klæbefolien (34) og skilleafdækningsstoffet (14).

5. Sporsikringsfolie (32) ifølge krav 4, kendetegnet ved, at der til ophævelse af virkningen af klæbelaget (12) i kantområdet fast er forbundet en i det væsentlige ikke transparent materialestrimmel (18), navnlig en papirstrimmel, med klæbelaget (12).

6. Sporsikringsfolie (32) ifølge krav 4 eller 5, kendetegnet ved, at skilleafdækningsfilmen (14) på siden af den i det væsentlige ikke transparente materialestrimmel (18) ikke går helt til

kanten af klæbefolien (34), men derimod ender i området for den i det væsentlige ikke transparente materialestrimmel (18), fortrinsvis således at den tilsvarende endekant på skilleafdækningsfilmen (14) i det væsentlige flugter med den indvendige side på endekanten af materialestrimlen (18).

7. Sporsikringsfolie (32) ifølge krav 6,
kendetegnet ved, at
den i det væsentlige ikke transparente materialestrimmel (18) på sin ved hjælp af den tilbagespringende skilleafdækningsfilm (14) tilgængelige side (26) er udformet til permanent optag af en påskrift.

8. Sporsikringsfolie (32) i tilstanden før brug ifølge et af kravene 1 til 7,
kendetegnet ved, at
denne har en væsentlig større længdeudstrækning end dens breddeudstrækning, og at der på tværs af længdeudstrækningen er tilvejebragt en eller flere perforeringer, navnlig mikroperforeringer, til en let adskillelse af enkelte sporsikringsfolieafsnit.

9. Sporsikringsfolie (32) i tilstanden før brug ifølge et af kravene 1 til 8,
kendetegnet ved, at
denne er udformet som vare på rulle.

10. Sporsikringsfolie (32) ifølge et af kravene 1 til 9,
kendetegnet ved, at
- den transparente kunststofbærefolie (10) på klæbefolien (34) er fremstillet af PP (polypropylen), fortrinsvis med en lagtykkelse på ca. 50 µm, og/eller
- at klæbelaget (12) i det væsentlige er formet som et vandopløseligt klæbemiddel, og/eller
- at skilleafdækningsfilmen (14) i det væsentlige er fremstillet af en PET-folie, fortrinsvis med en lagtykkelse på ca. 50 µm, og/eller

- at skilleafdækningsfilmen (14) er fremstillet silikoniseret til fremstilling af skillevirkningen i det mindste på den side, som vender mod klæbelaget (16).

11. Sporsikringsfolie (32) ifølge et af kravene 1 til 10, kendetegnet ved, at
klæbelaget (12) har en tykkelse på 10 µm til 100 µm, fortrinsvis på 10 µm til 30 µm, særligt foretrukket på ca. 18 µm med en tolerance på ca. ±2 µm.

12. Sporsikringsfolie (32) ifølge et af kravene 1 til 11, kendetegnet ved, at
klæbelaget (12) er indstillet på en sådan måde, at det er muligt at løsne de sikrede spor ved hjælp af et opløsningsmiddel, navnlig den såkaldte tyrkiske opløsning.

13. Anvendelse af en sporsikringsfolie (32) ifølge et af kravene 1 til 12, navnlig af en sporsikringsfolie til sporsikring ved ulykkesskader på fartøjer,
til
- en visuel undersøgelse af de sikrede fremmede partikler fra begge sider;
og/eller til
- en sammenligning af prøver ved at lægge sporsikringsfolier indeholdende i bevaring tagne genstande sandwichagtigt over hinanden.

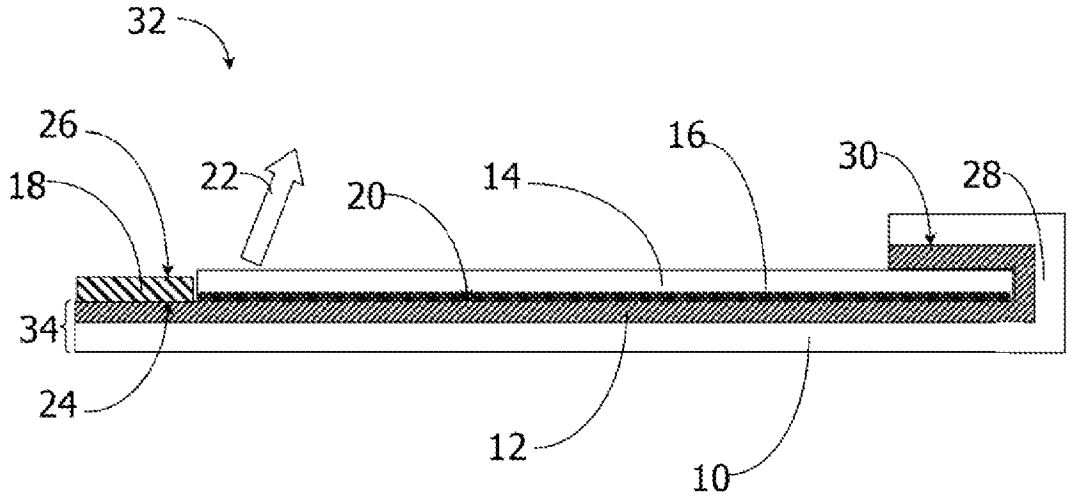

Fig. 1