US 20070160784A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0160784 A1**

Hung (43) **Pub. Date: Jul. 12, 2007**

(54) **STRUCTURE DESIGN OF SCRATCH AND ABRASION RESISTANT FILM**

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(21) Appl. No.: **11/329,112**

(22) Filed: **Jan. 11, 2006**

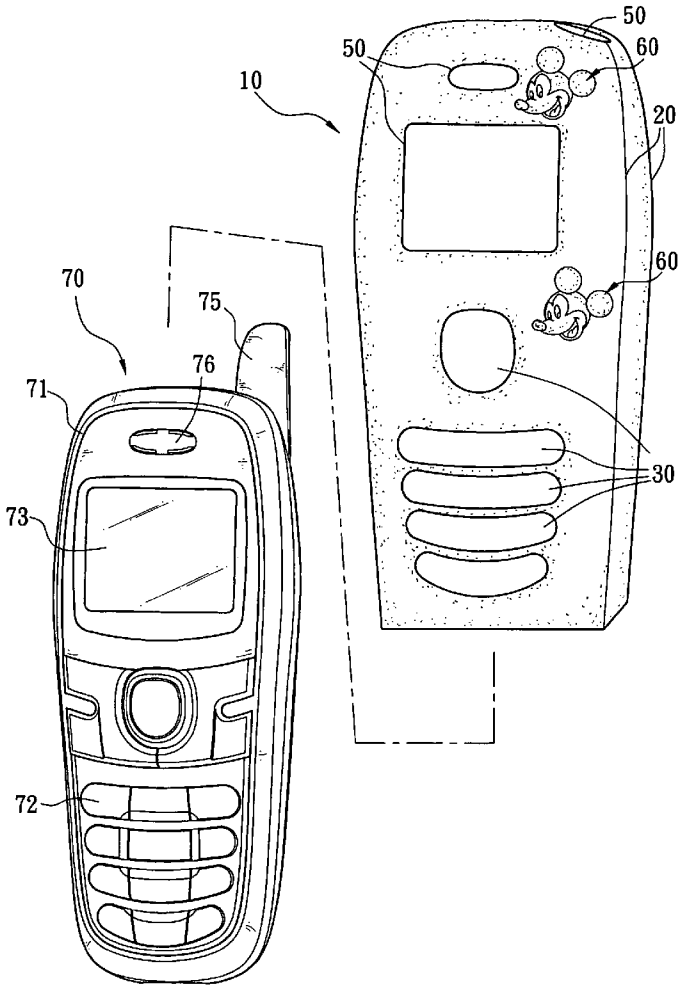
Publication Classification

(51) **Int. Cl.**
F16B 4/00 (2006.01)

(52) **U.S. Cl.** **428/34.9**; 428/43

(57) **ABSTRACT**

The present invention is to provide a structural design for a scratch and abrasion resistant film, which is a heat-shrink film having a plurality of predetermined positioning contour lines and holes disposed thereon in accordance with the contour corners of a case and the external parts, such as buttons, antenna, etc., of a communication device so that when the communication device is sleeved in the heat-shrink film and the heat-shrink film is heated to shrink, by means of those positioning contour lines and positioning holes maintaining the alignment with the corresponding contour corners and the external parts on the case, the heat-shrink film is shrunken to the right positions to smoothly cover the case, serving as a protection layer for the case against being directly scratched and attaining the scratch and abrasion resistant purpose.



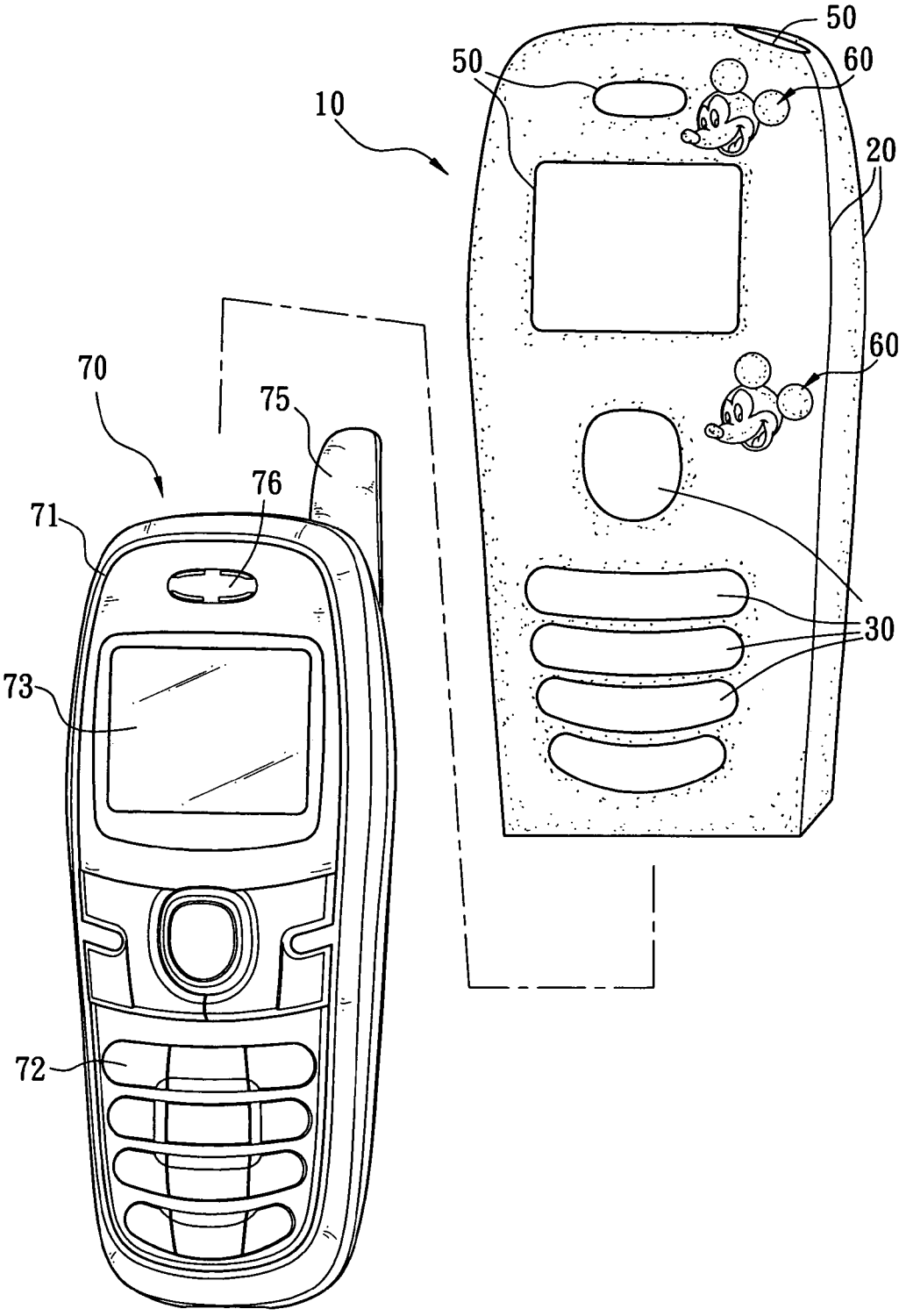


FIG. 1

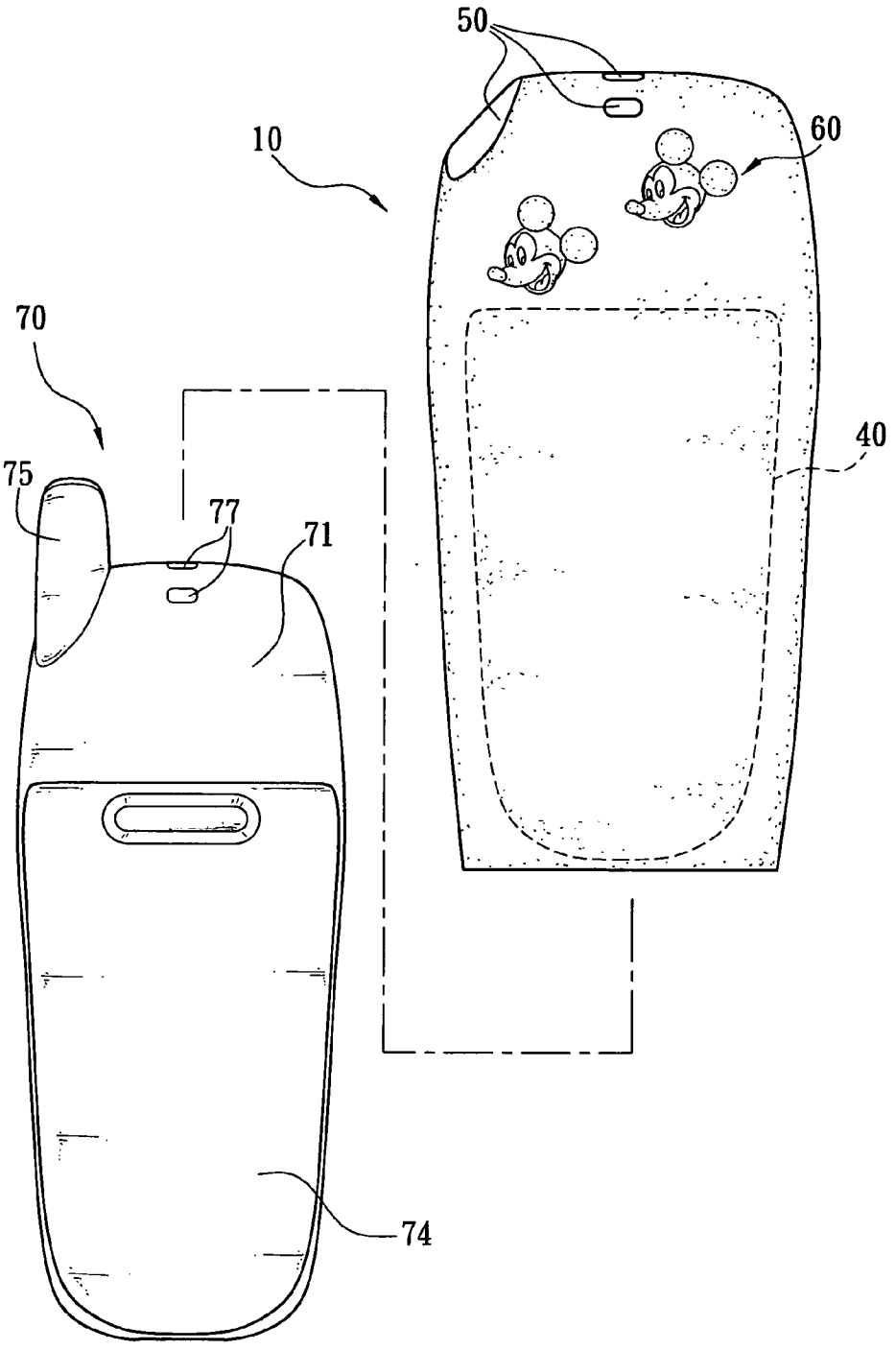


FIG. 2

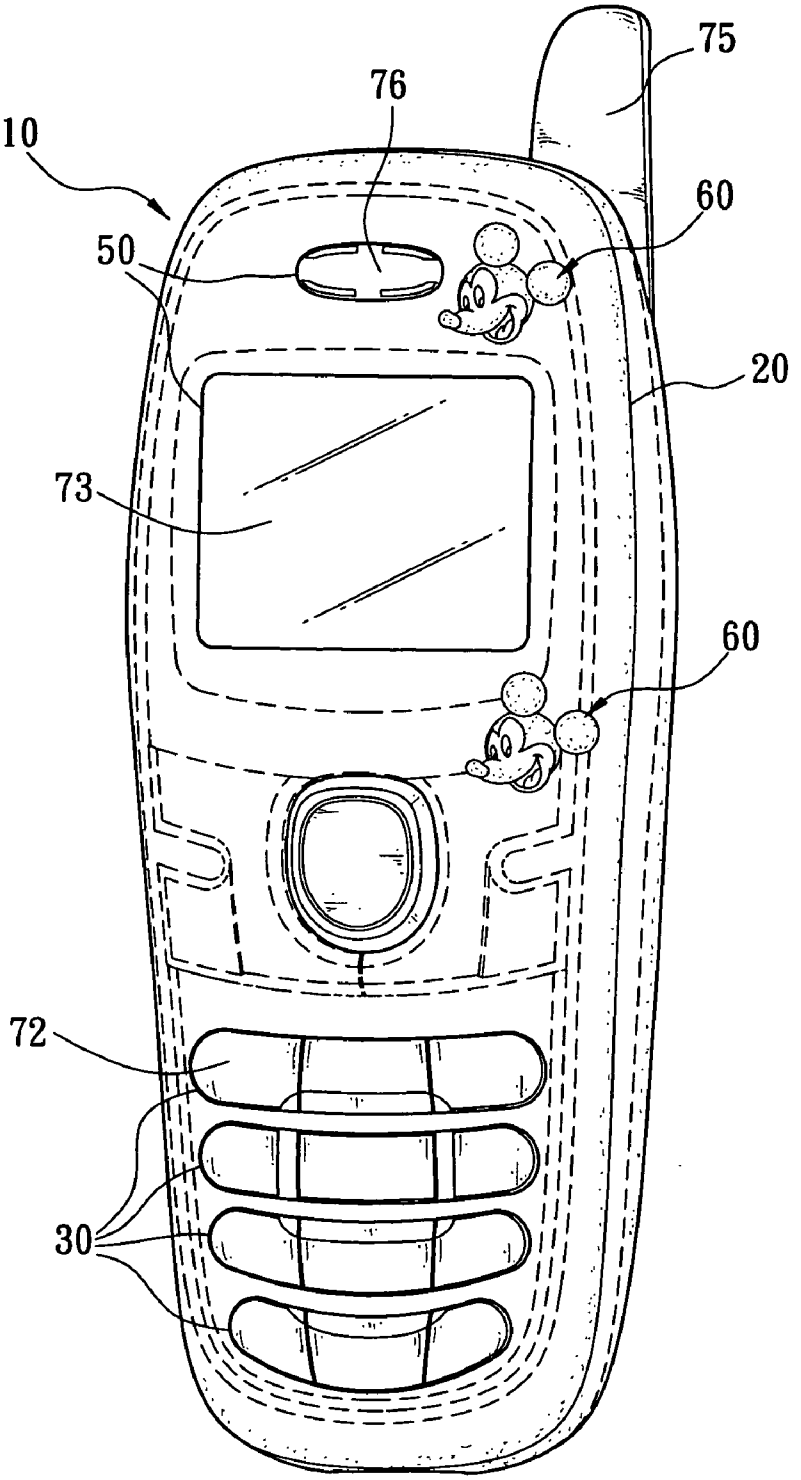


FIG. 3

STRUCTURE DESIGN OF SCRATCH AND ABRASION RESISTANT FILM

FIELD OF THE INVENTION

[0001] The present invention relates to a scratch and abrasion resistant film, and more particularly to a structural design for a scratch and abrasion resistant film capable of being heated to shrink to the right positions to smoothly cover a case of a communication device and serving as a protection layer for the case against being directly scratched.

BACKGROUND OF THE INVENTION

[0002] Nowadays, the global technology changes with each passing day. More and more delicate electronic products have been vastly utilized to further improve the life quality of mankind. The advent of the mobile phone brings about more comfort and convenience into personal life. While the function of mobile phone is getting more powerful and the size is getting smaller, industry and consumer have the increasing demand toward the appearance of mobile phone. Currently, the case of mobile phone is mainly composed of plastic material for sake of the concern of cost saving and light weight. However, the plastic material has low hardness that is apt to be scratched. As a result, after being used for a while, mobile phone tends to leave trace or peeling paint arising from scratch and abrasion.

[0003] As a consequence, mobile phone manufacturers designed a mobile phone with the swappable case so that user can always have new case with different pattern in place. Such move not only makes mobile phone more personalized, but also keeps mobile phone like a brand new one, making user feel satisfied constantly. Whereas, such mobile phone with the swappable case gives rise to the additional cost out of each case and the considerable used cases easily cause overrun garbage and environmental protection issues. Therefore, how to design a scratch and abrasion resistant film to solve the mentioned issues, protect mobile phone and provide personalized style, is a subject on top of the list to be immediately tackled.

SUMMARY OF THE INVENTION

[0004] In view of the shortcomings while practically utilizing the aforementioned mobile phone, the inventor, based on years of technical experience and accumulated professional knowledge, targets at the mentioned issues in an attempt to develop a structural design for the scratch and abrasion resistant film of the present invention.

[0005] In accordance with the first aspect of the invention, a structural design for a scratch and abrasion resistant film is provided. The provided scratch and abrasion resistant film is a heat-shrink film having a plurality of predetermined positioning contour lines disposed thereon in accordance with the contour corners of a case of a communication device, a plurality of predetermined positioning holes disposed in accordance with the external parts, such as button, antenna, etc., of the communication device so that when the communication device is sleeved in the heat-shrink film and the heat-shrink film is heated to shrink, by means of those positioning contour lines and positioning holes maintaining the alignment with the corresponding contour corners and the external parts on the case, the heat-shrink film is shrunken to the right positions to smoothly cover the case, serving as a protection layer for the case against being directly scratched and attaining the scratch and abrasion resistant purpose.

[0006] In accordance with the second aspect of the invention, at least a decoration part is provided. The decoration part disposed on and/or beneath the heat-shrink film has an animal pattern, a plant pattern, a numerical pattern or a geometric figure. When the communication device is covered by the heat-shrink film, the pattern design of the decoration part can be shown on the communication device, providing the communication device a more striking appearance and a more personalized style.

[0007] The above and other objects, features and advantages of the present invention will become apparent from the following detailed description taken with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. **1** is an exploded view showing the heat-shrink film and the communication device of the present invention;

[0009] FIG. **2** is a 3D exploded view showing another side in FIG. **1**; and

[0010] FIG. **3** is a schematic view showing the 3D assembly in FIG. **1**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0011] The invention relates to a structural design of a scratch and abrasion resistant film. Please refer to a preferred embodiment shown in FIG. **1** including a heat-shrink film **10**. The structural design of the heat-shrink film **10** is designed to target at a communication device **70** (e.g. mobile phone) so as to match the external structure of the case **71** of the communication device **70**. The heat-shrink film **10** is disposed at least a positioning contour line **20** and a positioning hole **30** in advance. Each positioning contour line **20** corresponding to a contour corner on the case **71**, and each positioning hole **30** corresponding to the external part, such as a screen, a button and an antenna, are disposed on the communication device **70**. Therefore, after the user of the heat-shrink film puts the communication device **70** in the heat-shrink film **10**, the positioning line **20** and the positioning hole **30** align with the corresponding contour corner and the external part on the case **71** respectively. Then the heat-shrink film **10** is heated to diminish gradually. While the heat-shrink film **10** is getting dwindled, each positioning hole **30** and positioning contour line **20** still align with the corresponding contour corner and external part on the case **71**. Consequently, as shown in FIG. **3**, the heat-shrink film **10** can be gradually shrunken at the right position to smoothly cover the case **71** and provide a protection layer for the case **71**, preventing the case from being directly scratched and attaining the scratch and abrasion resistant purpose.

[0012] Please refer to FIG. **1** again. A decoration part **60** is disposed on and/or beneath the heat-shrink film **10**. The decoration part is a pattern design in form of an animal figure, a plant figure, a numerical modeling or a geometric figure. As such, after the case **71** of the communication device **70** is covered by the heat-shrink film **10**, the pattern design of the decoration part **60** is shown on the commu-

nication device **70**, making the appearance of the communication device **70** more striking and having a more personalized style.

[**0013**] Please refer to FIG. **2** showing another preferred embodiment of the present invention. There is a tear-off line **40** disposed on the heat-shrink film **10**. The tear-off line **40** is designed to extend along the perimeter of a battery **74** of the communication device **70**. After the case **71** is smoothly covered by the heat-shrink film **10**, by means of ripping off the tear-off line **40**, the portion of the heat-shrink film **10** corresponding to the battery **74** is removed to facilitate the later replacement of the battery **74**.

[**0014**] Moreover, please refer to FIG. **1** and FIG. **2** again. An opening is disposed on the heat-shrink film **10** corresponding to the screen **73**, the speaker **76** or the ornament hole **77** of the communication device **70**. After the case **71** is smoothly covered by the heat-shrink film **10**, the opening **50** exactly aligns with the screen **73** or the speaker **76** so that the screen **73** can be clearly shown without affecting the voice made by the speaker **76** or the general ornament is enabled to be coupled with the ornament hole **77**. Besides, the positioning contour line **20** of the heat-shrink film **10** and the rim of the positioning hole **30** and the opening **30** can be pre-heated to diminish while producing the heat-shrink film **10**, ensuring that the positioning contour line **20**, the positioning hole **30** and the opening **50** won't be dwindled again due to heating. Consequently, when the communication device **70** is enveloped in the corresponding heat-shrink film **10** and heated once again, the positioning contour line **20**, the positioning hole **30** and the opening **50** can be aligned to the contour corner and the external part on the case **71** more steadily.

[**0015**] While the invention herein disclosed has been described by means of specific embodiments, numerous modifications and variations could be made thereto by those skilled in the art without departing from the scope and spirit of the invention set forth in the claims.

What is claimed is:

1. A structural design of a scratch and abrasion resistant film having a heat-shrink film and designed for a case of a communication device, wherein said heat-shrink film comprises:

at least a positioning contour line corresponding to a contour corner of said case; and

at least a positioning hole corresponding to an external part pertinent to a screen, a button or an antenna on said communication device.

2. The structural design of a scratch and abrasion resistant film of claim 1, wherein a decoration part is disposed on or under said heat-shrink film.

3. The structural design of a scratch and abrasion resistant film of claim 2, wherein said decoration part is a pattern design in form of an animal figure, a plant figure, a numerical modeling or a geometric figure.

4. The structural design of a scratch and abrasion resistant film of claim 1, wherein a tear-off line is disposed on a position of said heat-shrink film corresponding to a battery of said communication device.

5. The structural design of a scratch and abrasion resistant film of claim 1, wherein at least an opening corresponding to a screen or an ornament hole of said communication device is disposed on the heat-shrink film.

6. The structural design of a scratch and abrasion resistant film of claim 1, wherein said positioning contour line and a rim of said positioning hole are preheated to get diminished upon manufacturing said heat-shrink film.

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