# LOOPED PILE FILM ROLL CORE

## Background

During the process of manufacturing polymeric films such as optical films, the web needs to be wound onto cores to form the rolls of material to be sold. Typically, a cut transfer process is used to begin winding the web onto the core. In a cut transfer process, the starting end of the web is adhered to a core using a strip of adhesive tape, or a strip of doubled sided adhesive tape. Because of this attachment scheme, the leading edge of the web is over-lapped by the subsequent layers of wound web, and causes an effective disparity on the core surface which can increase the stress in adjacent web layers. This disparity can propagate impressions to several adjacent layers of the web, causing defects that are often referred to as core impressions. These core impressions can be observed on many of the initial layers of wound web material on each roll, and can be considered as wasted product.

## Summary

The disclosure generally relates to a looped pile film roll core used for winding a polymeric film, a method of winding film on the looped pile film roll core, and a roll of film that includes the looped pile film roll core. The disclosure describes an article and a process to reduce the core impressions created by the starting end of a web on the adjacent web layers next to the core. In one particular embodiment, the present disclosure can lead to a reduction in the amount and severity of such core impressions on a wound polymeric film, by reducing the amount of stress in adjacent layers of wound web.

In one aspect, the present disclosure provides a film roll core that includes a cylindrical tube having an outer surface and an engagement cover comprising a resilient looped pile fabric, wherein the resilient looped pile fabric is a knit fabric comprising a base layer having first and second faces and a resilient looped pile protruding from the first face, and the engagement cover is disposed over the outer surface of the cylindrical tube.

~~In another aspect, the~~The present disclosure also provides a method of winding film that includes disposing a film tangentially adjacent to a film roll core, the film roll core having a

cylindrical tube including an outer surface and an engagement cover comprising a resilient looped pile fabric, the engagement cover disposed over the outer surface of the cylindrical tube; adhering the film to the engagement cover; maintaining tension on the film; and rotating the film roll core about a central axis, thereby winding the film onto the film roll core.

What is claimed is:

1. A film roll core, comprising:

a cylindrical tube having an outer surface; and

an engagement cover comprising a resilient looped pile fabric,

wherein the resilient looped pile fabric is a knit fabric comprising a base layer having first and second faces and a resilient looped pile protruding from the first face, and the engagement cover disposed over the outer surface of the cylindrical tube.

~~2. The film roll core of claim 1, wherein the resilient looped pile fabric is a knit fabric comprising a base layer having first and second faces and a resilient looped pile protruding from the first face.~~

~~3. The film roll core of claim 2, wherein the base layer comprises a woven base layer, a knitted base layer, a non-woven base layer, or a combination thereof.~~

~~4. The film roll core of claim 1, wherein the engagement cover attaches to the outer surface of the cylindrical tube by compression, adhesion, mechanical attachment, or a combination thereof.~~

~~5. The film roll core of claim 2, wherein the resilient looped pile faces toward the outer surface of the cylindrical tube.~~

~~6. The film roll core of claim 2, wherein the resilient looped pile faces away from the outer surface of the cylindrical tube.~~

~~7. The film roll core of claim 1, wherein the engagement cover comprises a tube shape or a rectangle shape.~~

~~8~~2. The film roll core of claim 1, wherein the resilient looped pile fabric comprises a fibrous material selected from poly(tetrafluoroethylene), aramid, polyester, polypropylene, nylon, wool, bamboo, cotton, or a combination thereof.

~~9~~3. The film roll core of claim 1, wherein the engagement cover further comprises a material that shrinks when exposed to heat, moisture, or a combination thereof.

~~10. The film roll core of claim 9, wherein the material that shrinks comprises wool, cotton, polyvinylalcohol (PVA), polyester, or a combination thereof.~~

~~11. The film roll core of claim 9, wherein the material that shrinks comprises a fiber.~~

~~12. The film roll core of claim 1, further comprising an adhesive disposed between at least a portion of the cylindrical tube and the engagement cover.~~

~~13. The film roll core of claim 1, further comprising a hooked fastener disposed adjacent to at least one end of the outer surface of the cylindrical tube, thereby attaching the engagement cover to the cylindrical tube.~~

~~14. The film roll core of claim 1, wherein the resilient looped pile fabric comprises a fiber having a size ranging from about 70 denier to about 200 denier.~~

~~15. The film roll core of claim 1, wherein the resilient looped pile fabric comprises loops having a height from about 1.25 mm to about 2.7 mm.~~

~~16. The film roll core of claim 1, wherein the cylindrical tube comprises a steel tube, and aluminum tube, a polymeric tube, a composite tube, or a paper tube.~~

~~17. A method of winding film, comprising:~~

~~disposing a film tangentially adjacent to a film roll core, the film roll core comprising:~~

~~a cylindrical tube having an outer surface;~~

~~an engagement cover comprising a resilient looped pile fabric, the engagement cover disposed over the outer surface of the cylindrical tube;~~

~~adhering the film to the engagement cover;~~

~~maintaining tension on the film; and~~

~~rotating the film roll core about a central axis, thereby winding the film onto the film roll core.~~

~~18. The method of claim 17, wherein adhering the film comprises applying a single-sided adhesive tape to the film and to the engagement cover.~~

~~19. The method of claim 17, wherein adhering the film comprises applying a double-sided adhesive tape between the film and the engagement cover.~~

~~20~~21. A roll of film, comprising:

a film roll core comprising:

a cylindrical tube having an outer surface;

an engagement cover comprising a resilient looped pile fabric, the engagement cover disposed over the outer surface of the cylindrical tube; and

a web of film wound around the engagement cover,

wherein a first film edge of the web of film compresses the engagement cover such that subsequently wound layers of the web of film include minimal impressions of the first film edge and/or a transfer tape secured to the first film edge.