SOME METHODS USED IN SWEDEN TO PHOTOGRAPH SHOEPRINTS AND FINGERPRINTS

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ABSTRACT: The quality of a fingerprint is, of course, very important for both serching in the Automated Fingerprint Information System (AFIS) anf for the comparison with prints of a suspected person. We know, from past experience, that very thin and hardly visible prints often contain more detail and iformation than we initialy expect. Photographing these types of prints to recover the maximum detail has traditionally required high tech methods and cameras with expensive bellows systems. It would not be possible to photograph prints of these types with good detail using a standard camera or a digital camera.

We have developed a new photographic technique that captures excellent detail. This new method involves a casting technique, projected light and a transparent mirror. This method has provited excellent results, particularly in cases involving CNA developed fingerprints and fingerprints in blood. The method can be used with a standard camera and also with a digital camera for the AFIS system.

KEY WORDS: Fingerprints; Photography; AFIS.

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The most commonly used methods in Sweden for securing shoeprints are:

1. Electrostatic dust print lifter, DLK (at the crime scene);
2. Electrostatic vacuumbox (in the lab);
3. Gelatine lifter (at the crime scene and in the lab);

In this presentation we will show the photographic technique we use for these methods.

We will also show a new technique to photograph fingerprints with transparent mirror and projected light.

DLK

Electrostatic lifting means always lifting dry dust from a print to a lifting film. When we work at the crime scene with the DLK, we normally use lifting film in rolls. When the crime scene investigator unrolls the film on a suspected area of the floor it is important that the ground cable is connected to

the floor and the high voltage probe (with the voltage switched on) is connected to the upper (metallic) side of the film, (photo A).

This technique will minimise the air bubbles and the air gap between film and floor. After this process the used part of the lifting film is rolled up on a paper tube (photo B).

Suitable length of the lifting film should not be longer than 3 meters for each lifting.

Photo A.

Photo B.

Shoeprints lifted with DLK is photographed with low oblique light. We have good experience by using a normal slide projector as a light source from a distance of approximately 2 meters.

The exposure time for that type of print is in the normal case 1–5 minutes.

One problem with this long time of exposure is that the scale can be over-exposed. A good idea to solve this problem is to start the exposure with the scale on a suitable position beside the print. After some seconds of exposure, switch off the light, remove the scale without moving the lifting film and than switch on the light to continue with the exposure.

Another problem with electrostatic lifting is that you very often have disturbing dust in the background in lifted prints. To solve this problem we use compressed air to "clean" the print from background dust. It seems that the dust particles in the print are more stable and do not release when we blow with compressed air. A print cleaned from the background dust shows much higher contrast and often more details.

VACUUMBOX

The vacuumbox is designed for lifting shoeprints from papers and for developing indented writing. One advantage with lifting shoeprints with the vacuumbox is that you get no air gap between paper and lifting film because of the vacuum. It gives prints with higher quality and sharpness. This is important especially when the print is lifted from a wrinkled or curved paper (photo C). The lifting film is clear like a window glass. Lifted prints are photographed in low oblique light with black background ("dark field lighting", photo D, E).

GELATINE LIFTER

Gelatine lifters are manufactured in transparent, black and white colour. From our experience we get the best result with black Gelatine lifters. The quality of prints lifted with Gelatine lifters depends very much on the photographic method. If the Gelatine lifter has been used for a clear dusty print we often have the best result with low oblique light. We have also noticed that some types of prints give very thin impressions in the glossy surface of the lifter.

For that type of print the result is much better when using reflected light which is shown on photo F. One result with that technique is shown in a case with photo G.

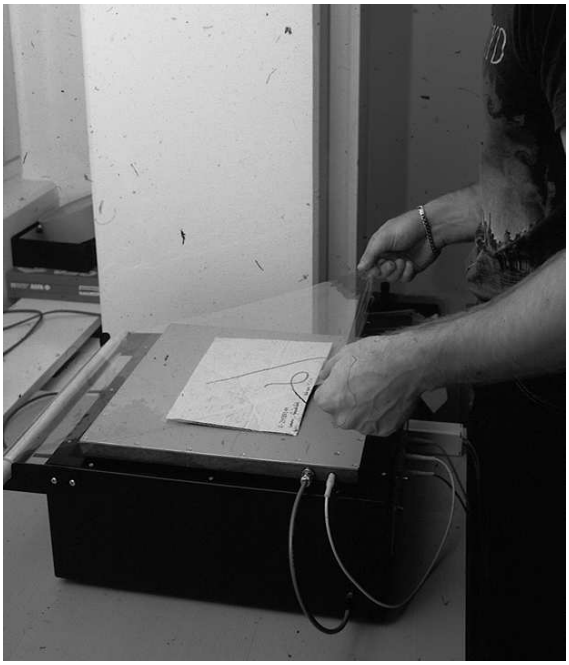

Photo C.

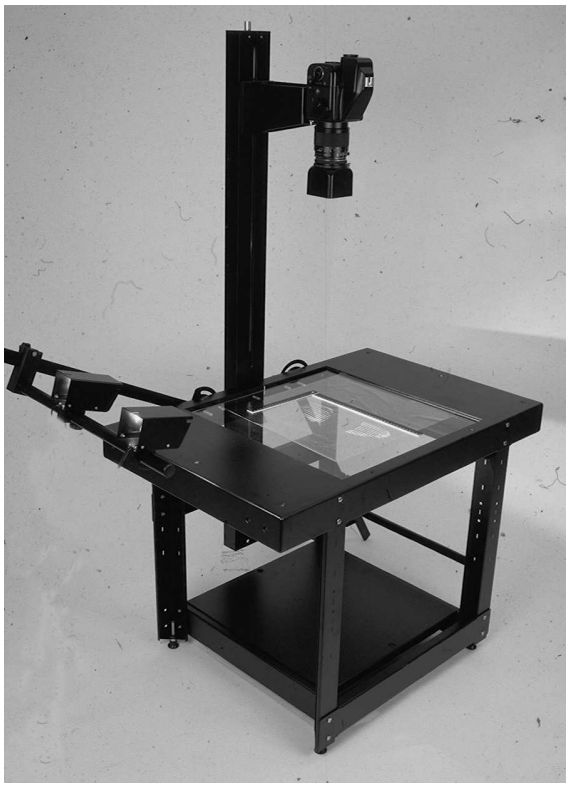

Photo D.

Photo E.

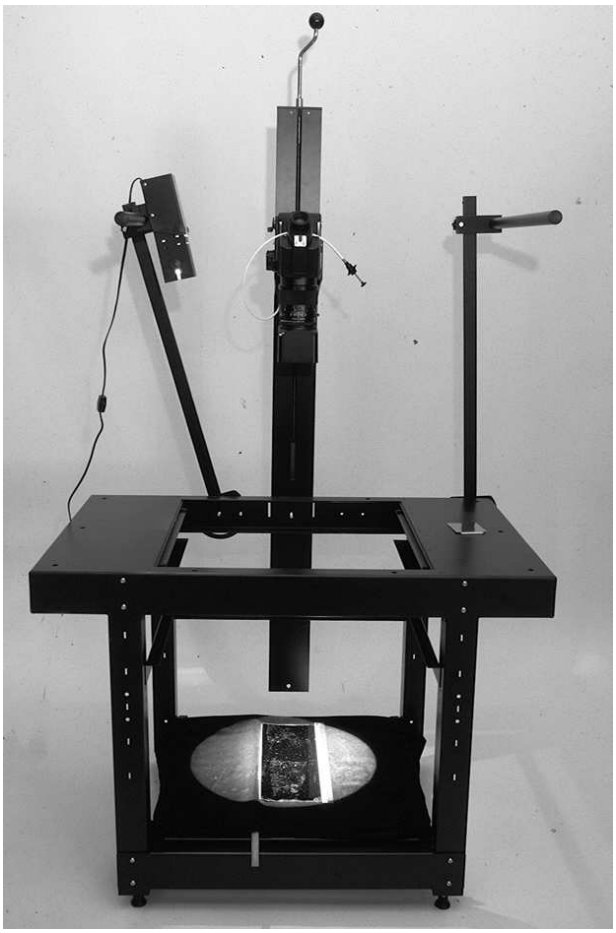

Photo F.

Photo G.

PHOTOGRAPHING FINGERPRINTS IN TRANSPARENT MIRROR

The quality of a fingerprint is, of course, very important for both searching in AFIS and for the comparison with prints of a suspected person. We know, from past experience, that very thin and hardly visible prints often contain more details and information than we initially expect. Photographing these types of prints to recover the maximum detail has traditionally required a high tech method and expensive cameras with bellows systems. It would not be possible to photograph prints like these with good detail using a standard camera or a digital camera.

We have developed a new photographic technique that captures excellent detail. This new method involves a casting technique, projected light and a transparent mirror. This method has provided excellent result, particularly in cases involving CNA developed fingerprint and fingerprints in blood. The method can be used with a standard camera and also with a digital camera for the AFIS system.

For this new technique we have developed a small light box with an adjustable transparent mirror and with a lens system for a suitable projected light, which is shown on photo H.

When we photograph CNA developed prints on plastic bags it is very important that the area of the print is 100% flat. One technique we use is to mount the piece of plastic with the print on a paper board with a ”stretching technique” using pieces from tape like on photo I.

Photo H.

Photo I.

The result from one case with this technique is shown on photo J. The same print was also photographed with our standard method with fluorescence filter and after normal Basic Yellow treatment (photo K). In this case the result was much better with the new technique.

Photo J.

Photo K.

In another case we also involved a casting technique in this photographing method. Some fingerprints on a glass were developed with CNA. The result from our first attempt with our standard methods was not so good, which is shown on photo L.

Photo L.

To be able to use the new photographing method with transparent mirror we made a casting on the print with Black Mikrosil. A good idea to get a flat casting – which is important for the result in the end – is to use a piece of silicone treated paper (standard paper for adhesive). This piece of paper is fixed just beside the print with a piece of tape (like a hinge) as photo M shows. This must be done before the hardener is mixed in the Mikrosil.

Next step in the process is to cover the print with a thin casting of Black Mikrosil, photo N. Immediately afterwards the casting is covered with the silicone paper. It is now important to gently press with your fingers resulting in no air gap between the paper and the Mikrosil, photo O.

Photo M.

Photo N.

The Mikrosil will be fixed to the silicone treated side of the paper and the result is a flat casting, photo P.

By using the new photographic method with transparent mirror on this casting we got a much better result compared with our standard method, which shown on photo Q.

Photo O.

Photo P.

We think this photographic method can be very useful even for some types of shoe prints. We have started some tests with our new photo table and transparent mirror in a size suitable for shoeprints. The first result is very promising. Photo R shows the photo table with the transparent mirror mounted in 45 degree between the camera and the print.

Photo Q.

Photo R.