The Postage Meter Tops Off Mail Preparation

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Introduction

Rolland Hill, a worker in the British Treasury at the time, wrote a pamphlet "Post Office Reform: its Importance and Practicability" in 1837. This lead to a change in how postage was charged and to the invention of the first postage stamp, issued in May 1840. We need only took to our bookshelves for a recent copy of the Scott Catalogue to measure the result of that invention.

It has been said that business people immediately saw problems. The first postage stamps came as sheets that needed to be cut up with a scissors and some form of glue was needed to attach them to the letter. This was okay for a few letters, but very difficult if a business had to post a large number of letters. Even the more thoughtful inventions of perforation and gum did not really improve the situation. For that matter the postage stamp did not improved significantly over the next 170 years. Business people realized something had to be done to improve the efficiency of mail preparation.

Inventors began to think of ways to use machines to reduce the workload for companies that had large mailings. One idea was a machine that could print a postage stamp on a letter. A search of the patent literature was accomplished by Joel Hawkins (1). The first known patent (figure 1) awarded for what we now call a postage meter was given to Hiram Cobb (2). It seems that Cobb may never actually have built or tested this particular machine.

Figure 1. Hiram Cobb patent 1881.
The first known machine (figure 2) to actually be built and tested was the DiBrazza meter (3, 4, 5).

![Figure 2. Dibrazza patent 1898.](image)

This 400 lb contraption was tested as a means to register letters. A letter stamped for normal mail would be given a registry mark, paid for by a coin (figure 3).

![Figure 3. Dibrazza stamp (5).](image)

The boxes appear to have been tested for about 3-4 months and removed. Only two prints from this machine are known, one with a collector and one in a museum. A very similar coin operated machine that registered a letter was tested briefly in Paris by a Hungarian inventor Antal Fodor (6). Several examples of marks from this test are known.
While some were working to develop what was to become the postage meter, others were developing stamp affixing machines. Companies like Mailometer and Shermack (7) began to produce stamp coils as early as 1902 to be either vended or to be mechanically affixed to letters (figure 4).

Figure 4. Early Schermack Stamp Affixer (www.theswedishtiger.com/coils.html)

These companies had to buy imperforate sheets and make rolls of stamps themselves. Today, of course, the US Postal Service sells large rolls of stamps for bulk mail preparation. Some of the machines designed to affix stamps today are designed to replace the postage meter in obsolete mailing machines (figure 5).

Figure 5. Postmatic 7000SA Stamp Affixer.

Another aspect of adhesive postage stamps was they needed to be cancelled so they could not be reused. A wide variety of handstamps have been used and are still used today. As early as the 1870’s inventors were beginning to develop machines to replace the handstamp method. Thomas Leavitt (8) is thought to have been the first to test cancelling machines and the Smithsonian
National Postal Museum (9) has several of his patent models in its collection. This issue will become important later.

**Early Postage Meters**

The DiBrazza machine fits the definition of a postage meter, an impression that pays for a postal service, is dated and needs to be used immediately. The next machines to be used to prove payment of postage were tested in Norway in 1900 (10). A machine built by Kahrs (figure 6) was used at the Oslo head post office.

![Figure 6. Kahrs Meter, Norway 1900.](image)

This particular stamp was a receipt stamp, and the clerk would affix an adhesive stamp of the same value to the cover. In 1903 a second machine was built by Uchermann-Krag (figure 7).

![Figure 7. Uchermann-Krag Meter, Norway 1903](image)

Seven machines were placed in post offices and private firms for a short time. After these tests Norway discontinued postage meter experiments until the 1920’s. The next tests were run in New Zealand in 1904 when two companies, Moss and Wales, introduced several meter machines (10). These experiments lead to commercial acceptance. New Zealand has seen continuous use of postage meters from that time on.
Meanwhile, in the United States Arthur Pitney began to apply for patents as early as 1904 (1). Pitney was granted two tests of his inventions in 1912 and 1913 (figure 8). A number of fliers were sent out during these tests but none of the postally used covers seem to have survived. Pitney printed a number of proofs and a few of those survive as cuts. As the story goes, a post office examiner noticed that Arthur Pitney and Walter Bowes were applying for similar permissions and suggested they get together. The two worked together for some time and began to market a cancelling machine and eventually a permit printer machine.

On 5 August 1921, Pitney and Bowes, as the Postage Meter Company, placed the first commercial meter (figure 9). The meter, Model M, was designed to fit into the base of the canceller and permit printer (figure 10) they had developed earlier.
The meter impression (figure 11) was actually identical to the design of permits of the time except that there was an “M” and a number printed vertically between the value box and the townmark. This similarity caused the US Post Office to order Pitney and Bowes to change the design. As a result they introduced the first meter oval design on 19 January 1922 (figure 12).

All of the Model M postage meters were chanced over to the new design by 15 April 1922. The Oval design was used well into the 1940’s and was used by a total of nine postage meter suppliers (10), most of which Pitney and Bowes eventually bought out.

**Auxiliary Equipment**

The first postage meter was designed to fit into a piece of equipment that had originally been designed to cancel mail. Other pieces of equipment had also been marketed to assist in the preparation of mail. A collection of office documents of Bircher, a company that sold envelope openers as early as 1920, has provided pictures of early equipment.
Many of these pictures (figure 13) were taken from elaborate letterheads of correspondence found in this collection.

Envelope addressers were sold by Wallace and Longini as early as 1910. An envelope opener was available from Bircher in 1920 that may have been available much earlier. Bell and Howell introduced what it claimed to be the first folder/inserter in 1925. Of course, already mentioned, were the early stamp affixers (7).

Today the vendors of postage meters in the United States, Pitney Bowes, Francotyp-Postalia and Neopost, actually find much of their business to include equipment and services designed to prepare mailings. Large mail preparation shops use equipment that can fill a large room. Figure 14 shows a modern Pitney Bowes printer/folder/inserter, for example.
It must be emphasized that at the receiving end, a good deal of equipment is needed for post offices to sort the mail. That is another story (11).

**Development of the Postage Meter**

**Mechanical Meters**

The early postage meters were completely mechanical. Most had electric motors to run the equipment but some were small hand crank models. The “meter” part of the equipment which kept accounts of postage available and used, consisted entirely of mechanical wheels. The early models were fairly easy to break into and the post offices suffered subsequent loss of revenue. Later models were considerably more sophisticated but there is only so much an inventor can do to prevent tampering.

The first models, like the Model M in Figure 9, were single value meters that could print just one value. If a different value was required, the first meter was detached from the mailing machine and replaced by another meter. If two values were needed to make up a particular rate the envelopes had to be run twice, once each with the two (or sometimes three) meters needed.
The next advancement was the “limited” value (figure 15). These generally could print 3, 5 or 10 different values. The values were selected by the operator by turning a wheel or moving a lever. If a letter required postage that was not available directly on the meter the operator would run the letter to print one value, then change to a second value to make up the entire rate with the second (or third) print. There are examples of covers with 10 or more strikes to make up a particular rate.
There were two types of limited value meters (figure 16). The earliest contained three (or five or ten) square dies, one for each value. The later advancement contained only one die with a hole in the middle. The value figure that was chosen by the operator printed through that hole.

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Omni-valued meters are able to print any value between zero and some upper value (figure 17). This made it much easier for an operator to print mail of varying rates or to adjust for a rate increase.

**Electronic Meters**

As the electronic industry advanced some electronics slowly began to appear in postage meters as well. The first fully electronic postage meter probably was the Touchomatic from Pitney Bowes in 1967 with a keypad very like the popular touch-tone telephones of that era. Very soon improvements were made so that postage could be added to the meter over the telephone (figure 18) rather than taking it to the post office.

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Figure 17. Omni-value Meter.

Figure 18. Fully Electronic Meter.
The electronic meters still printed the meter indicia with a mechanical printer and a die plate, but the electronics now took care of the accounting functions. This brought a measure of security to the postage meter but it was still possible to subvert the design. Cases are known where mail preparation sites learned to fool the electronics. A notable recent case (12) reported a scam in which the post office was defrauded about $14 million during the time just before the post office required the obsolescence of all mechanical and electronic postage meters.

The USPS and Canada jointly developed the Meter Migration Mandate in which virtually all non-digital postage meters were removed. In Canada this occurred in mid-2007 and in the US at the end of 2008. Virtually all meters are now digital in these two countries.

**Digital Meters**

Fully digital postage meters conducted postage accounting digitally and printed the indicia using computer printers began to appear in the early 1990’s. Early models printed what appeared to be random numbers next to the indicia. These were actually early security codes that were different for each piece of mail. Ostensibly, a postal worker could easily look at a batch of mail from a postal customer and see that each piece was unique, with different numbers. The Pitney Bowes PostPerfect model (figure 19) was typical of this type of postage meter.

![Figure 19. Early Digital PostPerfect Meter Imprint](image)

Later more technically advanced meters appeared with complex barcodes. There appears to have been some experimentation until the USPS settled on the use of a barcode technology known as Datamatrix (figure 20).

![Figure 20. Datamatrix Digital Meter Imprint](image)
Collectors have learned that the Datamatrix barcode can be decoded to an extent. The coding has two sections, public and encrypted. The public area can be decoded (14) with some modest computer skills. The encrypted area is prepared with CIA quality coding (15) to protect from postal fraud.

The plan is for the USPS sorting facility to be able to automatically scan the Datamatrix postage meter print to determine instantly if the mail piece is franked correctly and by a legitimate postal customer. The equipment at this date has not been installed. The USPS sorting facilities do use hand held scanners to test incoming shipments from mail producers to test the quality of the sort before acceptance of the load.

Figure 21. Worldwide use of Datamatrix Digital Meters.

The use of this type of barcode has spread around the world, Figure 21. At least a dozen countries are known to be using these types of meters. Not all of them use the cryptography used by the USPS and Canada Post.
Conclusion

A wide range of equipment has been developed to assist in mail preparation. Today the entire process from the printing of a mail piece, the folding and stuffing of the envelope, sealing and postage payment are automated. Today there is a mailing machine that prints the meter indicia in red or black and then prints the slogan, address and return address in multiple colors.

Postage can be paid in several ways. Most high volume mailings use the permit rates based on the count of items in the log. Some of the permits can be very colorful (16) and can attract some attention from the receiver, but most are simple squares containing the required text that clue the receiver to the mundane nature of the mailing. A postage meter can be used for high count shipments and some mailers believe that this indicates the mailing might be a little more important and there will be a higher chance that the mailing will be opened.

One of the postage meter’s most important advantages is to the small and medium sized mailer who has less than permit quantity mailings. The meter removes the need to carry postage stamps for various rates, and automates the entire postage payment process.

References

7. Steven Gelasco, Guide to United States Vending and Affixing Machine Perforations 1907-1927