A New Posting Method for the Preparation of a Cumulative List*

By HERMAN SKOLNIK and WARREN R. PAYSON
Technical Information Division, Research Center,
Hercules Powder Company, Wilmington, Delaware
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The preparation of cumulative lists is a common operation in chemical documentation. Examples of such lists are: subject heading lists, current journal subscriptions, trademarks, holdings or inventory lists, lists of publications by author, list of reports by author or project number, and special indexes. These lists are prepared in an alphabetical, numerical, classified, or date order, or in combination of these. The primary purpose of a cumulative list is to communicate data or information on a current basis to many people in different locations.

Despite the wide use of cumulative lists in information operations, practically no studies in this phase of documentation have been published. Because of the high potential saving in manpower and because of the increased efficiency of communication that might be realized, we have been investigating for several years various posting methods for the preparation of cumulative lists. This paper describes a posting method based on a new panel and card designed at the Hercules Research Center and compares this method with one based on the Acme Super-Visible Photo Panel and card and with another we developed which uses the Remington Rand Chaindex card. The three posting methods are used in combination with xerography and multilithing for the communication of data or information throughout Hercules Powder Company.

A New Posting Panel.—The more an information system can do, the better it is, providing the advantage of multiple uses is not nullified by manpower and storage costs. We wanted to use stock-size cards, such as 5 × 3, 6 × 4, 7 × 5, and 8 × 5 inches, in a posting operation for the following advantages: (1) the cards may be used in a permanent file, such as an author index, after they have served the need for communicating a cumulative index; (2) file drawers are stock items, and consequently storage cost is low; and (3) card platens for typing are readily available and low in cost.

Our major requirement of a posting system for the preparation of a cumulative list is photographic. Unless the posted entries can be assembled conveniently in a page format and xerographed to give a Multilith master without shadow lines between entries, the system is less desirable as a communication medium.

There being no commercial panel available for assembling stock-size cards, we designed one with the following desiderata in mind: (1) the panels should be as light in weight as possible; (2) assembly and removal of cards should be easy and fast; (3) the panel should hold the cards securely so that the cards may be stored on the panel for as long as necessary; and (4) assembled panels should be xerographed easily without shadow lines.

Sheet aluminum met the weight requirement. Aluminum spacers were spot welded to the aluminum sheet; strips with a V bend were spot welded along the outside edge to the spacers. The panel is illustrated in Figures 1A and 1B. Tension of the strips on the cards is determined by two variables: (1) the shape of the V and (2) the width of the strips. These two variables were set by trial and error. The aluminum spacer between the aluminum sheet and strip acts as a control on the tension as well as serving as an alignment bar for the inserted cards. The V bend was made with a sheet metal brake. The type of aluminum is very important if the panel is to lie and remain flat and if the strip is to maintain its tension. We found that Alclad 2024-T3 aluminum yields a suitable panel.

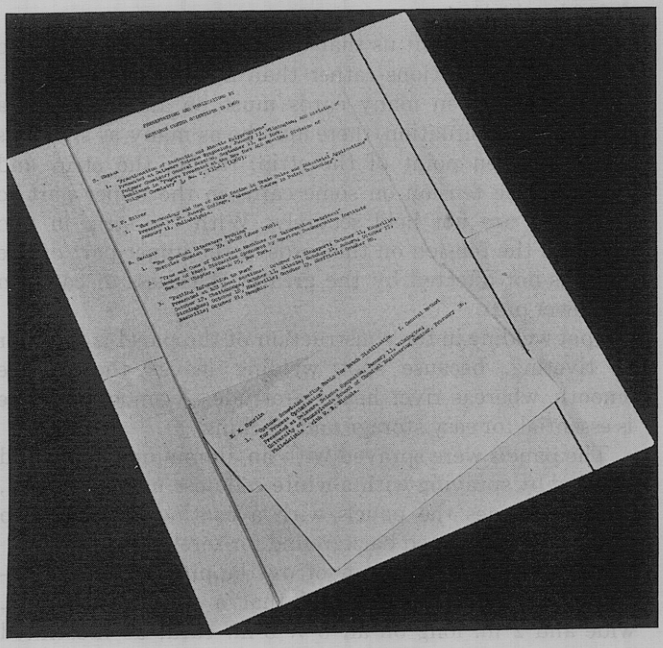

Fig. 1A.—Front view of an aluminum panel with 8 × 5 in. cards.

The panel backing or aluminum sheet is 15 in. long, 12.25 in. wide, and 0.032 in. thick. The spacers along and

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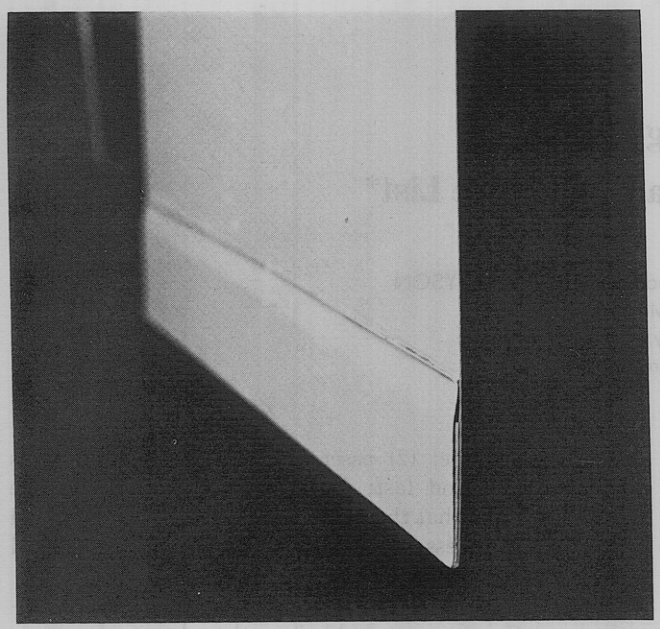

Fig. 1B.—End view of an aluminum panel

even with the right and left edges are 15 in. long, 1.375 in. wide, and 0.032 in. thick. The strips along and even with the right and left edges are 15 in. long, 1.75 in. wide, and 0.016 in. thick.

Experience taught us that the strip should be attached in two 7.5-in. sections rather than in one 15-in. section, particularly when many cards must be assembled on a panel. In this situation, there may be as many as six cards under a given point of the strip, raising the strip and releasing the tension on some cards in the upper part so that they are not held securely. With the strip in two sections, the tension on the cards in the upper part of the panel is not affected by the greater thickness of cards in the lower part.

Spot welding in the construction of the panel is superior to riveting, because spot welding leaves the surface smooth, whereas rivet heads protrude. A smooth surface is essential for easy storage and stacking.

The panels were sprayed with an aluminum primer and finished by spraying with a white cellulose nitrate enamel, which provides the panels with a coating easy to keep clean and with a good background for xerography.

To obviate the problem of overlapping cards, we designed a new card. We found that a side tab 0.375 in. wide and 2 in. long on an 8 × 5-in. card, as illustrated in Figure 1A, provides enough surface for the aluminum strip to hold the card securely. This design prevents the cards from overlapping under the strip beyond a maximum thickness of two cards. These cards of course must be specially cut, and before they can be made a part of a permanent file the tab must be cut off.

Uniform spacing between entries is achieved by starting the typing at a predetermined distance from the top of each card. On inserting cards in the panels, alignment of the top of one card with the bottom of the last line of the preceding card automatically provides the same distance between posted entries.

The panel may be used to prepare one- or two-column lists. For two-column lists, a 5 × 3-in. card without a side tab is used as shown in Figure 2. Overlapping of these cards does not cause the inconvenience experienced with cards longer than 3 in. It is necessary, however, to maintain at least 0.375-in. left and right margins on these cards so they can be used in either the left or right column. There is a 0.25-in. overlap of the cards in the two columns. This slight overlap eliminates the line which would appear and be reproduced between the two columns if the cards were abutted.

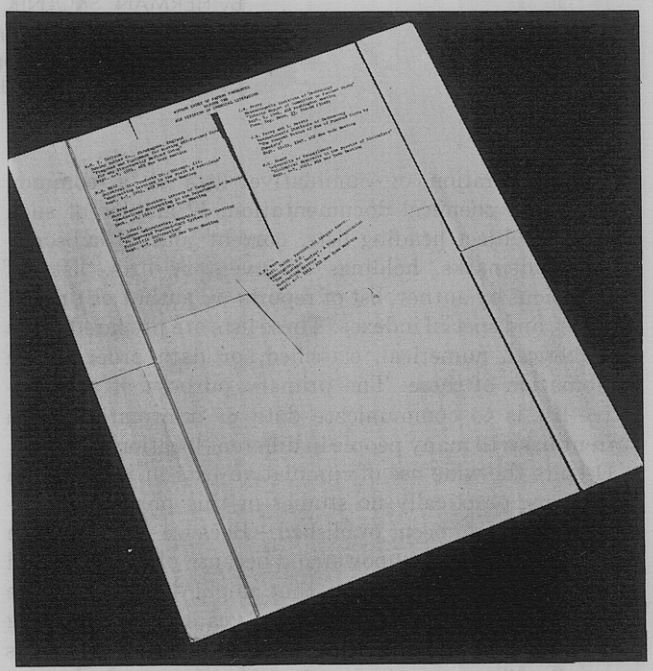

Fig. 2.—Aluminum panel with two columns of 5 × 3-in. cards

The Acme Super-Visible Photo Panel.—The Acme Super-Visible Photo Panel was specifically designed by Acme Visible Records, Inc., Crozet, Virginia, for posting by means of cards cut to hold one to three lines of typing, and subsequent photographic duplication of the entire panel. The reproduced page is equivalent to reproduced type copy providing the panel is illuminated with at least three lights properly placed to overcome slight shadows cast by the assembled cards.

One to four column panels are available. The panel illustrated in Figure 3 is 12.25 in. wide and 17.5 in. long. It is equipped with four runways to give two columns, each 5.5 in. wide, or one column 11 in. wide. For two columns, cards 5.5 in. wide and 1.5 in. long are attached to the left or right pair of runways by means of "wings" which are die-cut in the cards and whose tips hook under the runway edges. Similarly, for a one-column page, cards 11 in. wide and 1.5 in. long are attached to the two outside runways. An assembly of cards is locked on the panel by means of a metal spring clip for two-column arrangement or an elevator for one-column arrangement. The clip or elevator is readily removable and new cards are inserted easily in any position on the panel, although most easily at the end of an assembly of cards.

Cards are typed by placing them in a specially constructed card holder available for use with an IBM Electromatic typewriter. This card holder is somewhat of an inconvenience if the typewriter is also used for

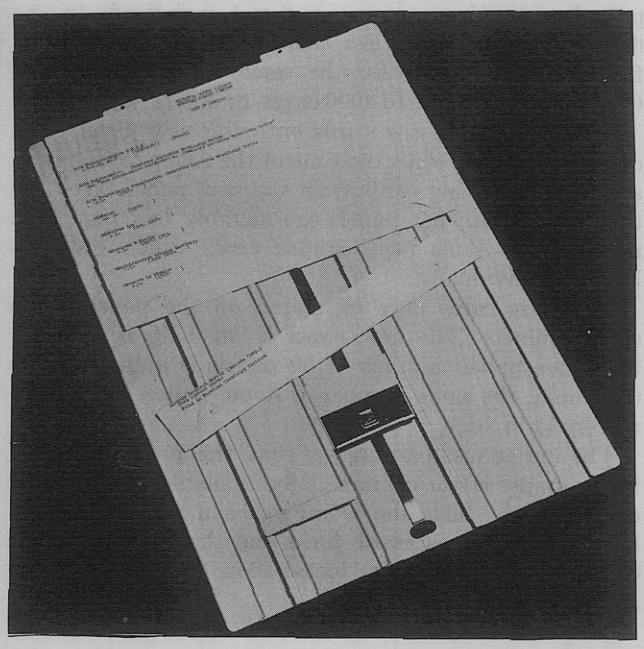

Fig. 3.—Acme Super-Visible photo panel and cards

ordinary typing for then it must be released from the carriage. The best arrangement is to assign the typewriter for use only with the Acme cards, but this is feasible only if the workload justifies it. The card holder is well designed: the card is placed in front of and thus is not bent by the platen; it is limited, however, to a maximum of three lines.

Use of Acme Super-Visible Photo Panels for the preparation of cumulative lists is of great value when the posting is in a regular order and when the number of needed panels is relatively small. When the posting is in random order and many panels are needed, insertion of the cards in the correct position on the correct panel is tedious and time consuming. Because the cards can be stored only on the panels, investment in panels and cabinets for the panels is necessarily high.

Use of Remington Rand Chaindex Cards.—Remington Rand Chaindex equipment and cards are well known in posting operations. Chaindex cards are available in several widths and in lengths from 0.875 in. to 1.3125 in., and thus allow up to five lines of typing. The cards are available as singles and as strips or gangs of 500 cards with perforations between them. The advantage of the card strips is that typing may be continuous and no card platen is necessary. As shown in Figure 4, the cards are interlocked by inserting the two tabs of one card into the two slots of the preceding card. The cards are stored in Chaindex cabinets on a backing with matching slots for mounting assembled cards.

We found that an assembly of Chaindex cards mounted on heavy paper or cardboard may be xerographed and multilithed to give copies as clean as those obtainable from Acme cards. The secret here, as with Acme cards, is in the proper placing and balancing of lighting during xerography. Inasmuch as Chaindex equipment and cards are not designed for duplication, the backing for cards in the cabinet is considerably smaller than a normal page and there is no panel available for mounting cards for xerography. To mount the cards on heavy paper or cardboard, it is necessary to cut a slot in the mounting for the top card or else to paste a blank card on the top of the mounting for assembling cards.

Because Chaindex card strips may be typed continuously, information is put into the file considerably faster than it is with Acme cards. Time required to assemble cards is essentially the same for both, that is, card onto card. In a large file, however, it is more time-consuming to handle the Acme Panels than it is to store Chaindex cards in cabinets. The Acme cards, once assembled, are ready for xerography, whereas the Chaindex cards must be transferred from the cabinet to mounting cardboard, and back into the cabinets after duplication. Transferring Chaindex cards would be less of an inconvenience if the backing in the cabinet were 8 × 11 in. or larger.

Discussion and Conclusions.—Each of the three methods described in this paper plays an important role in the communication of cumulative lists of data or information. Each has its advantages and disadvantages.

The most important advantage of the Acme card and panel is that it is commercially available. The Acme method is excellent for files that do not grow rapidly and which have relatively few open ends. Its disadvantages are the need for a typewriter with a special card holder, relatively high storage cost and space, and the handling of too many panels for a rapidly growing file with random open ends.

Chaindex cards have the advantage of being available in strips as already described. Furthermore, Chaindex strips do not require a card holder for the typewriter. The lack of a commercial panel is not a great inconvenience for, as we have shown, it is a relatively simple matter to mount the cards on cardboard. That Chaindex cards can be xerographed has been important to us in

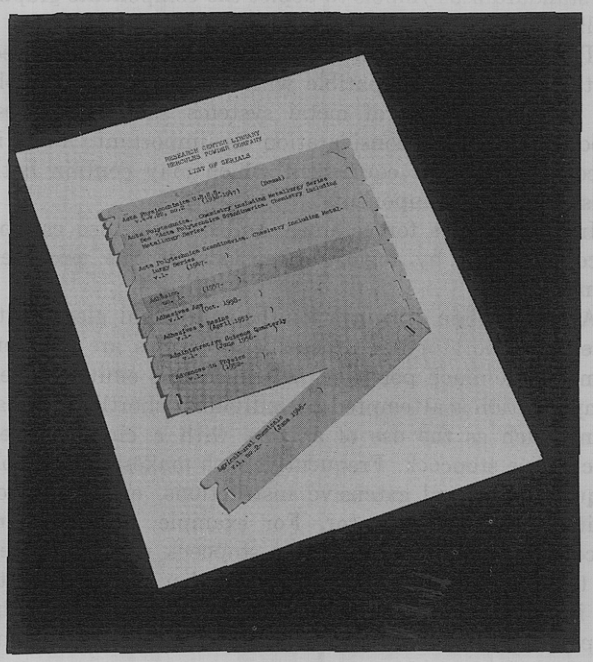

Fig. 4.—Remington Rand Chaindex cards assembled on paper backing

producing a printed index to a body of documents on a monthly or quarterly schedule, closing the index at the end of the year with the printing of a cumulative index, and beginning a new index at the start of the next year. A schedule such as this, if feasible, keeps the index within manageable bounds and storage cabinets within reasonable limits. The unavailability of a storage cabinet with 8.5 × 11 in. or larger backings, however, is a disadvantage.

The new posting panel described in this paper has eliminated the serious disadvantages of the other two systems and offers the added advantage of using a card of dimensions suitable for a permanent card file, thus eliminating one typing operation. Acme and Chaindex cards are of no use after they have served the need for communicating a cumulative list.

We like the ease and speed of putting information into the Chaindex system. This advantage is realized in part with stock-size cards. Thus, in posting consecutive entries or several lines under a single heading, only one insertion of the card into the typewriter is required. We have posted up to 25 entries on an 8 × 5 inch card. In one file, we needed to use less than 700 8 × 5 inch cards for posting 4000 entries; the same file on Acme and Chaindex cards required 4000 cards, or one card per entry.

Assembling stock-size cards onto the new panel takes one-fourth to one-sixth the time of the Acme or Chaindex systems. Removing cards from the new panel takes less than one minute per panel, considerably less time than required for Acme or Chaindex cards which must be handled individually.

Stock-size cards may be stored on the panels or in stock cabinets. The new panel is one-half as thick as the Acme panel: a stack of 50 panels is approximately 6 in. high; the same number of Acme panels is approximately 12 in. high.

The major disadvantage is that the panel described in this paper is not commercially available and must be custom made. This shortcoming has not been particularly serious for us as we have had them made in our own and at a local sheet metal shop for between $3.00 and $4.00 per panel.

Graphic Symbols for Glass Systems*

By F. E. McKENNA
Information Center, Central Research Laboratories
Air Reduction Company, Incorporated, Murray Hill, New Jersey
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Increased industrial use of glass components, in addition to the everyday use of glass in vacuum systems and laboratory apparatus, presents an ever-increasing need for standardized symbols to depict the components graphically.

The symbols for glass components which are proposed in this paper are compatible with the accepted symbols for the components of metal systems such as valves, elbows, *etc.* This consideration is important if it is necessary to depict equipment which may contain both glass and metal components.

Increasing uses for ceramics and cermets also can be accommodated by logical extensions of the proposed symbols.

Actual outline drawings for the individual glass parts of either laboratory or process installations are cumbersome, while much pertinent information is omitted when simplification is attempted by individual shorthand notations, such as the use of a cross with a circumscribed circle for a stopcock. Frequently, such makeshift symbols require additional extensive instructions, either oral or written, to the fabricator. For example, notations are necessary to indicate whether a stopcock is to be turned in the plane of the drawing or whether the cock is to be installed in a plane perpendicular to the plane of the paper. Additional notations also are required to define the type of cock: a solid or hollow plug, or an oblique or straight bore. A actual outline drawing of the components precludes a rapid freehand sketch by the designer,

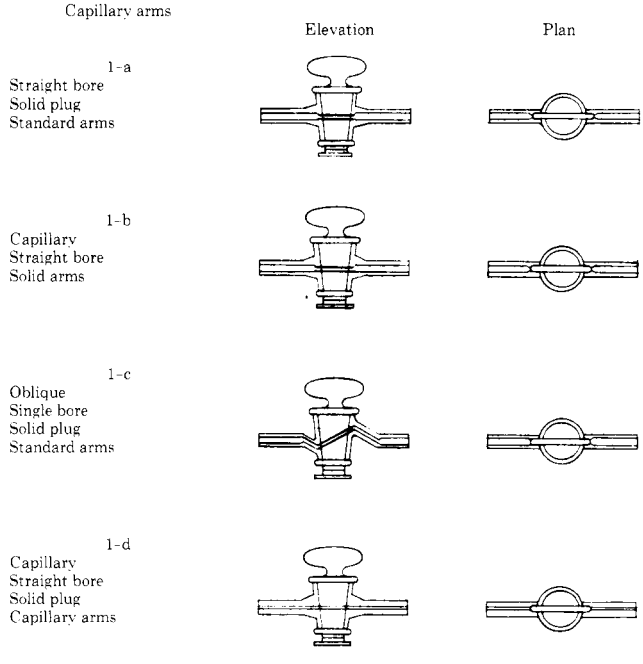

Fig. 1.–Conventional pictorial representation of stopcock types.

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